EDUCATIONAL REVIEW

DECEMBER, 1913

I

THE HOUSEHOLD OF KNOWLEDGE

Everyone who knows academic history is aware that the universities first came into being in the twelfth century as a result of two impulses—one, the new intellectual awakening, the other the instinct for association which suddenly aroused western Europe. The enthusiasm for knowledge, then awakened, would at best have been abandoned to a fitfully interrupted career and in many places would have perished, had it been left homeless. Students might "wander," but not universities. Like other guilds, the guild of knowledge needed its charter granting secured freedom to teach and learn and also needed its settled abode. Paris, the mother-university of us all, long consisted of residential colleges—later swept away, indeed, by the Revolution, but in a special and valuable sense reappearing in the École Normale Supérieure, founded by Napoleon, and the Fondation Thiers, which so brilliantly serve the higher thought of France today. The old colleges of Oxford and Cambridge—memorable, lovely, appealing—have sheltered the best scholastic life of England for now over seven centuries. There they stand, the oldest college homes in our modern world, and about them the spell of romance has been woven. And in the great German Empire it is keenly gratifying to know that the proposal of the patriot and philosopher Fichte, made so

[1]An address delivered at the dedication of the Graduate College of Princeton University, October 22, 1913.

long ago as 1807, is at last on the way to be realized in his loved University of Berlin, premier school of the German-speaking world. So it is with the utmost honor we welcome today representatives of this phase of the higher learning in the illustrious universities of Oxford and Cambridge, Paris and Berlin.

It is forty years since Joseph Henry advocated the suggestion of John Miller to establish here a College of Discoverers—a late reflection of Lord Bacon's august conception of the House of Solomon—and it is nearly forty years since President McCosh introduced graduate studies. It is seventeen years this day since President Patton announced the desire of the newly christened Princeton University to secure this Graduate College. And now it is here, ready to exercise its transforming power—a new home for higher investigation and study, founded on an old truth attested by centuries of history.

There are obstacles to the accomplishment of our work, and they are also the reasons why the work must be accomplished. Graduate liberal studies ought to set a standard for all other graduate studies in our land. Yet in the judgment of those who may be presumed to know, they are plainly in less satisfactory condition than work done in the better schools of law and medicine. They have been prosecuted with sincerity and energy, but too often without vision. Their tone and quality have been marred by a scattering and uncertain preliminary schooling, by mediocrity of mind, by the worship of degrees as means of securing positions, by the isolation of students due to an estrangement of special from general knowledge, by reliance on the mechanism of rules rather than on the free movement of the human mind in study, by a curiously persistent illiteracy and by lack of proper provision for the student's physical and social welfare. Moreover, in many ways graduate studies are not adjusted to the inexorable and often reasonable demands of the student's intended career. Something is lacking. That something can not be stated in a word, but it is something which calls for harmony be-

tween the student's work and his whole life, personal, professional and social—here in his studies, and later out in the world. It also calls for clear excellence as the one necessary standard for all his attempts.

In some degree the obstacles will probably always exist and they can not be removed merely by opposing them. They can be removed only by replacing them with something better. A positive force must enter and operate in the students themselves—a force not of compulsion, but of attraction. What we are seeking is to be found in the daily fellowship of kindred minds of rare promise, generous rivalry and high aspiration, the communion which reveals the unity of knowledge, the irresistible *élan vitale* that comes with the full swing and rush of intellectual freedom among comrades. Do we realize what fire the friendship of knowledge may kindle in a circle of young scholars? It is an old master, a supreme artist in thought, Augustine, once the central figure in such a group of students, whose words still glow as he depicts the scene: "Converse amid cheer and kindness, anon the reading of enchanting books, difference without dislike (as tho one in casual dissent from himself were preparing for many close consents), one learning from the other and again teaching him, wishing for the absent and hailing their return; and thus by a thousand pulses and signals of the heart, revealed in look and speech, setting every mind ablaze and blending many in one."

So we make our appeal directly to young men, young in spirit, rich in mental and moral store, quick in response to studious impulse, eager to seek and find, able to perceive, take and use the more valuable instead of the less valuable material of knowledge, open-eyed to ideas in their relevancy, worth and beauty, pulsing with energy, inventiveness and fantasy, men companionable, magnanimous and free. We are seeking to liberate and use in a society of such students an inner motive power which is sure to stir them profoundly. It is not reason and knowledge alone, but shining thru these the awakened imagina-

tion and affections. It is these that will lead the student not only to know the best in the best way, but also unconsciously to become himself better than what he knows. Environed by others in like mood, this inner driving impulse makes him aim at ever-increasing excellence, seeking not only to do his best, but perchance even the best that can ever be done, and done rigorously, incessantly and joyously. Here is real scholarship, the work of real men. These are the sons of knowledge, worthy to dwell together in her home. It is in such a place, full of endeavor and filled with friendship, the glorious saying of Aristotle will be fulfilled: "Pleasure perfects labor, even as beauty crowns youth." To such a fellowship in studies—rich, deep, ever-developing—Princeton invites all who can live this life in such a home, assured that when they leave it they will take with them doubled and trebled power.

No doubt educated men should be intelligent. They ought to think, of course. Yet thinking is not knowing. So they ought to do something more: they ought to know, and even to know what is best worth knowing. They ought also to master some one part of knowledge completely, and to add to it for the increase of knowledge, in order to guide their fellowmen. To this end they ought to be able to "dwell together in unity" with all who seek valuable knowledge, wheresoever it is to be found. And as their thought, slowly growing purer and surer, guides them on and on into wiser knowledge, so in every instance their growing knowledge, whether of acquisition or discovery, should lead them together unerringly to truth, and to the one truth in which all separate truths, however seemingly estranged, somehow and somewhere find their reconciliation and unity. Herein I hope will be the crowning glory of this household of knowledge. For our universities are a creation of Christendom, and long ago Princeton learned to believe in God as the end of all our knowing and in Christ as the Master of the Schools. In the western window of Procter Hall we have tried to write this truth in symbols of light and color. And the two sentences

there inscribed in a silent ancient language may well be uttered in our own tongue as the summary of our faith. The one tells the scholar's spirit: "And be ye not called masters, for one is your master, even Christ." The other tells the scholar's reward: "They that instruct many in righteousness shall shine as the stars forever and ever."

ANDREW F. WEST

PRINCETON UNIVERSITY

II

A COOPERATIVE INDUSTRIAL COURSE

The Experience of Fitchburg, Mass.

This course was adopted in 1908 at the request of the manufacturers of the city with the expectation that a higher degree of efficiency in shop work would be secured on the part of apprentices and that while learning his trade in a *real* shop an apprentice might continue his studies in certain lines. The course was instituted in response to a well-nigh universal demand for competent workmen, those who are able to do things not only when the foreman is at hand to give directions, but when the foreman is absent, in short—as some employers have stated repeatedly—the mission of this course is to prevent the loss which is occasioned by the employment of "half-baked" mechanics.

Prof. Herman Schneider of the University of Cincinnati presented to the country several years ago a plan whereby young men might work regularly in the shop and attend school alternately. This plan was adopted for technical students in the Cincinnati University, the shop taking charge of the practical training—the university proper having the direction of the work upon academic lines. The university or any institution of learning in which such a course is operative is thus relieved of the necessity of equipping its laboratories with expensive machinery, which in the course of ten or fifteen years may become obsolete. The students are acquiring a practical training such as no school of itself can possibly furnish. They are working in actual commercially operated plants.

Prof. Schneider, in May, 1908, at Fitchburg, in a public address at a meeting of the Metal Trades Association of that city, outlined the Cincinnati plan, whereupon the question was propounded: "Why would not this plan be practicable for a high school in which there are boys

from 14 to 18 years of age?" The reply of the school authorities of that city was: "The schools can care for all the boys and girls who desire to attend. Courses of study can be arranged for any who wish to work a part of the time and to attend school when not at work. The school will be held responsible for academic training. Outside agencies must be held responsible for results in industrial training whether that training is in the machine shop, the store, the home, upon the farm, or, in short, in any position in which manual labor is required."

Acting upon this suggestion efforts were at once put forth for the inauguration of a plan for a combination of shop and school course, the manufacturers offering the use of their shops for the practical instruction of apprentices, the school authorities providing the collateral instruction that would be needed.

Manufacturers as follows entered into the plan: The Simonds Manufacturing Company, manufacturers of saws and knives; the Fitchburg Steam Engine Company, manufacturers of steam engines; the Bath Grinder Company, manufacturers of grinding machinery; the Blake Steam Pump and Condenser Company, manufacturers of pumping machinery; the Cowdrey Machine Company, manufacturers of special and woodworking machinery; the Putnam Machine Company, manufacturers of lathes, planers, railroad tools and general machinery; the Fitchburg Machine Company, manufacturers of the "lo-swing" lathe; the Brown Steam Engine Company, manufacturers of steam engines; the Jennison Company, tinsmiths and piping engineers; and the L. H. Goodnow Company, iron founders.

The shops are equipped as no school plant can be equipped. The city is not required to expend one dollar for equipment—the state is not asked to aid in any manner.

A course of study was prepared and a class of twenty boys enrolled at the opening of the school year in September of that year. These boys had been in the high school

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previously, hence they entered upon the work of the second year going at once into the shops.

The course outlined is of four years' duration, the same as the regular school course. The first year is spent wholly in school and the next three years the boys alternate weekly between shop and school. Boys who enter the high school from the various grammar schools of the city elect the course they desire to take—the collegiate, the commercial and other courses including the cooperative industrial course—those electing this course entering the high school from a grammar school the same as those who choose other courses.

The manufacturers take the boys in pairs, so that by alternating they have one of the pair always at work, and likewise the school is provided with one of the pair.

Each Saturday morning the boy who has been at school that week goes to the shop in order to learn what his mate has been doing during the week so that the work can be carried along without a break the next Monday morning when the shop boy returns to school.

Shop work consists of instruction in all the operations necessary to the particular trade.

The course of study is as follows:

First year:

All school work:

	Hours per week
English	4
Arithmetic, tables and simple shop problems	5
Civics and American history	4
Algebra	5
Freehand, and mechanical drawing and bench work	10

Second year:

School and shop work:

English	5
Shop mathematics, algebra and geometry	5
Physics	4
Industrial history and commercial geography	5
Mechanism of machines	5
Freehand and mechanical drawing	5

Third year:

School and shop work:

English	5
Shop mathematics	5
Chemistry	4
Physics	4
Mechanism of machines (one half year)	4
Business methods (one half year)	4
First aid to injured	1
Freehand and mechanical drawing	6

Fourth year:

School and shop work:

English	5
Shop mathematics	5
Economics (one half year)	5
Mechanism of machines and jig design (one half year)	5
Physics, electricity and heat	4
Chemistry	6
Freehand and mechanical drawing	4

Any boy who is regularly admitted to the high school may, with the approval of his parents, elect this course. This year 165 boys are admitted to the high school, 64 of this number elect this course.

Boys receive pay for the weeks they are at work at these rates: For the first year, 10 cents an hour; the second year, 11 cents an hour, and the third year, $12^1/_2$ cents an hour; making $5.50 a week, or $165.00 for the first year; $6.05 a week, or $181.50 for the second year; and $6.87 a week, or $206.25 for the third year; a total of $552.75 for the three years. These rates are higher than former apprentices have been receiving, the manufacturers having of their own accord raised the prices.

The 20 seniors earned in one year	$4,125
The 20 juniors	3,630
The 30 sophomores	4,950
Total	$12,705

A boy is thus encouraged to continue at school. He can earn considerable while learning his trade and pursuing the part time course at school. He earns more than

many a boy earns who attempts to supply himself with funds while waiting for something to "turn up." Many parents can not afford to keep their children in school under the usual conditions. This course furnishes the boys an opportunity for contributing to this support while at the same time a boy avails himself of the opportunity of continuing his education. One of these students one year was the only support of the family for several months.

When there is a vacation week in school, work is provided in the shops and thus no boy is obliged to spend any time around the streets or in any other place looking for something to do.

The teacher who is at the head of this department confers with the managers of the various shops during the year and thus at the end of the year is able to place the boys in the respective shops. The shop work begins immediately at the close of the school year in June. All candidates are given a trial period of the two vacation months of July and August—altho some of the boys desire to take one or two weeks of the time for vacation. If a candidate likes the work and shows aptitude therefor he enters regularly into shop work and school work at the beginning of the school year in September, thus entering upon his three years' apprenticeship.

The framing a course of study for such students is a subject that demands thoughtful consideration. Pupils drop out of school because the work therein has little if any relation to the affairs of everyday life. These boys are at school but twenty weeks a year. This, however, is a longer period of time than was set apart in the old district school for boys, many of whom became excellent scholars.

The school year being thus limited in time, it is imperative that subjects of practical value must be included in the curriculum. That is the point upon which the manufacturers lay great stress—in the belief that such a course will tend to a higher degree of efficiency on the part of apprentices—that these young men by pursuing such a

course will thereby become better mechanics and be capable in a higher degree of advancing in a chosen trade.

The course was therefore outlined upon these lines:—

English.—This is made prominent during the four years. The pupil is expected to become familiar with forms of business papers and shop terms. He is given instruction in certain lines in order that he may endeavor to speak and to write intelligently and to spell correctly.

If a boy applies for a position, the form in which he presents that application will largely determine whether or not his application will be considered.

Mechanics who are sent from a shop to do a piece of work are often required to make written reports to their employers who in many instances complain that these reports are too indefinite.

Familiarity with shop terms together with their significance is an important feature of this work, and here is where many an academically trained teacher has difficulty. Attention is directed constantly to current events and industrial history, the daily happenings in the industrial world, the history of the iron industry, factory system and labor problems, new inventions, and reading of mechanical journals to keep in touch with mechanical affairs.

Mathematics is studied beginning with simple propositions in mensuration, fractions, metric system, circular measure. These apprentices must be familiar with general shop mathematics dealing with problems on cutting speeds and feeds, belting, gearing, strength of materials, and general cost figuring.

Algebra, which is studied in order that facility may be joined in using the formulae so common in the trade journals and handbooks, leads up to simple geometric and trigonometric formulae. The practical rather than the theory of mathematical science is sought. Mechanism as it is studied treats of the construction and the uses of the various machine tools that every shop contains. The names and the uses of every part are learned in the school as well as in the shop. The reasons for certain

shapes of the various parts, kinds of material used in their construction, shapes and kinds of tools used and their cutting action are clearly defined in the analysis of the shop work. The study of mechanics is essential since many good workmen can not in many instances tell why certain things are done in a certain manner. These men will say that this work has always been done in this manner and that the results have been fairly satisfactory. The reason can not be set forth.

Physics is the study of the laws underlying all mechanics, and here again the study of working examples is emphasized rather than the theories of abtruse phenomena.

Chemistry takes up the nature and qualities of the metals and salts, tests that can ordinarily be applied to fractured metals, hardening and tempering processes.

Commercial geography comprehends the study of the source of supply of the various industries, preparation and methods of transportation, cost of materials, railway systems, waterways, etc.

First aid to the injured. There is no place where accidents are more liable to happen than in the shop, and some knowledge of how to care for them is a valuable asset to the workman. The textbook of the National First Aid Association is used for this study.

Drawing is the sign language of the mechanic. Almost invariably, in explaining an object or piece of work, he takes his pencil and makes or attempts to make a drawing for the purpose of giving emphasis to his statements. A large share of the drawing period is thus devoted to freehand work, beginning with simple objects and proceeding to machine parts. Thus a workman sees the object and at the same time he becomes familiar with the proportions and shapes of ordinary machine parts. Later he draws them mechanically with instruments to scale.

Civics and American History are essential to good citizenship, and a careful study of the city and the state government is necessary for intelligent and progressive work.

Business methods.—Such a term includes the study

of the organization of shop systems, including the receiving of materials, laying out of work, tagging, inspecting, and routing of work thru the shop and also general office systems.

The workman will see the dependence of one department on the other, the necessity for the cooperation of all to secure good results.

He should appreciate the cost of doing business, should realize the fact that it is not all profit, that it costs something to erect and equip a manufacturing plant, conduct an office, and maintain a corps of salesmen and advertising agents. The apprentice who gives time and thought to these matters will—it is hoped—gain some idea of the great responsibilities of both the employer and the employee.

The main portion of what is set forth thruout this entire article is what has practically been stated by Mr. William B. Hunter, the efficient head of the industrial department. His exact words are here presented in detail:

"By weekly visits to the shops and inquiries of the boys in their school week I keep in close touch with their work. Should a boy feel that he is not getting just what he ought he is not at all slow in making the fact known. Then by taking the matter up with the proprietors and foremen, we soon find out whether or not a change should be made. A written report of the work in the shop is also past in on Monday morning of the school week and is inspected and filed for reference.

"Every opportunity for questions regarding shop work is encouraged in the school and these questions are of most intelligent nature. Many problems are ironed out that the shop has not the time to consider, and the interchange of methods used in the different shops broadens and helps all the boys.

"The question has been asked, 'What about the boy who wants to go to a technical school?' While this course was intended for those who wanted to become mechanics upon the completion of the course, they have, nevertheless,

an excellent foundation for a technical candidate. By putting in another year at the high school in the study of a foreign language and a few other college required subjects, the boy is not only well prepared, but exceptionally so. He knows what he is going for and can pass off his shop work and a great deal of drawing. Instead of losing he is a gainer. Several of our boys are looking forward to this plan."

The first class—twenty members—was graduated in June, 1911. These boys had earned $10,000.00 during the three years. Fourteen of this number were employed at once in the respective shops in which they had learned their trade—receiving from $12.00 to $15.00 per week—one is in charge of a division in a shop in another city at $20.00 per week, one has entered a university, one is in a business school, one is a foreman in a machine shop in another city.

Testimony to the worth of the industrial course is seen from the fact that eight of the graduates of the class of 1911 took evening courses in French and mathematics in the fall of that year with the intention on the part of a number of better preparing themselves for some technical school.

A class of twelve was graduated in 1912 and 19 in 1913. There will be next year approximately 100 pupils in the three classes.

The course which was established for boys intending to learn the machinist's trade has been extended. Some are now in textile establishments, some in offices, and in general there is a disposition to bring the school into close relation with the varied industries of the city.

Plans are in view whereby similar provision may be made for girls in the commercial course. Business and professional men in the city are in hearty sympathy with the movement. Stenography, typewriting, etc., subjects which are prominent in this course, may thus be taken into the counting room, the office, the store, thus affording the members of the class the opportunity to familiarize themselves with actual business transactions.

The school must endeavor to meet actual conditions.

The *Fitchburg Daily News* publisht one year after the course had been in operation replies from some of the boys to a series of questions that had been propounded to the members of the class. The questions and a few of the many answers are herewith presented:

QUESTIONS

1. What induced you to select this course?
2. Are you satisfied with it?
3. Would you have remained at school if the course had not been offered?
4. How are you pleased with the course?
5. Please state briefly the manner in which your time is spent during the week at school, and also the week in the shop.
6. Please state in what particulars you are profited by this course.
7. Do you intend to continue in it?
8. What do you intend to do after completing this course?

ANSWERS

Following are the experiences of the young men—in their own words—the names being omitted in each case:

I—1. "I selected this course as an advantage to future life. This course is also instructive and profitable. The reasons in general are as follows:

"Because after I have graduated from the high school, I shall not be a loafer in the world. I shall have a trade to fall back on.

2. "Because it is instructive. Things that I thot never could be done, have been realized before me, and in school the studies are very instructive, especially in mathematics. In this we study both shop and school.

3. "I am very much pleased with this course both in school and in the shop.

4. "My time is spent by studying in school at least five hours a day, if not more. In the shop I am doing jobs

both on lathe and bench. All this time I am learning the use of different tools.

5. "The particulars are: Learn all kinds of tools; learn how to study; the idea of learning a trade.

6. "I intend to enter a higher institution after I have completed this course."

II—1. "I desire to better myself.

2. "No, I had already left school, being dissatisfied.

3. "It is practical, it has no sissyism about it. The practical problems of life confront you.

4. "Three hours of the afternoon are spent in study, a few chores are done, and then time for recreation, as playing baseball, fishing and walking. Nights are spent in rest.

5. "It gives me money and helps me to be self-supporting. It gives us high school boys a chance to show that we are not afraid of soiling our hands. It also gives us a liberal education.

6. "I intend to follow it up, and understand a little of the large study of mechanics."

III—1. "I thought it was a good way to become a good mechanic.

2. "During the school week we go to school five hours a day and take up the different studies pertaining to the course. We have the afternoon to study. We play ball once in a while, etc. During the shop week we work ten hours a day at the different kinds of machine work.

3. "We get an education and at the same time learn a trade.

4. "The reason why I selected this course is because I like mechanism. One has an opportunity for working his way thru school and also an opportunity for saving money for later education.

"I am well satisfied with the course for many reasons, principally because instruction and the courses of study are right in line with the shop work.

"In the shop we are treated the same as the other apprentices, getting our share of everything. In school we learn things which we put in practise when we get in the shop.

5. "I am profited by the course financially and have learned more in this course while I have been in it than all I learned in three years of regular high school work.

6. "I intend to continue with the trade I have been working at."

Statements from a few of the many manufacturers as herewith presented:

1. "I was one of those who did not have any faith in the system when it was first proposed here, but I decided to give the plan a trial, and today I will say that it is surely the best thing of its kind in existence. If it is carried out along the present lines, it will surely be a success. A trial of nearly a year has convinced me of this fact, and I give it my most hearty approval."

2. "The boys with us are working half of the time in the shop, and half in the school, and are advancing as rapidly in their knowledge of the shop work and conditions (how to work with their hands), as under the old method of all shop work.

"There seems to be the spirit of trying to excel, trying to get all the knowledge they can out of the situation, and they seem to be looking for the 'why' things are done thus and so. The cooperative course is bound to be a success."

3. "We would say with regard to the boys of the cooperative class who are in our employ, that so far we feel well pleased with the results.

"The boys show an interest in their work and an ability in the direction of their work, which is fully equal to, if it does not surpass, that of the apprentice boys who work steadily in the shops. The mental rest and the enjoyment of the ideas which the schooling brings them seems to be a very fruitful cause of good in this direction. The work the boys turn out is good for the time they have been with us and we have great confidence in the outcome of this system."

JOSEPH G. EDGERLY

SUPERINTENDENT OF SCHOOLS
FITCHBURG, MASS.

III

THE NEW YORK SCHOOL INQUIRY

A PROTEST

School inquiries are in the air. School officials, the public, and the press are all making pertinent inquiries concerning the use of public money for the support of schools and the education and training offered to our young people.

The Department of Superintendence of the National Educational Association at its meeting in Philadelphia last February, adopted the following resolution:

> "*Resolved,* That we recommend expert surveys and investigations of school systems as helpful and valuable, when made by broad-minded, constructive committees, inspired by right educational motives, working under properly constituted authority, and wholly free from commercialism."

If *and sensationalism* had been added to the resolution, it would have been strengthened and improved.

No one can object at any time to an inquiry and criticism of the schools provided that the examination and criticism are made by competent and fair-minded men, experienced in the work they criticize, and provided the main purpose in such an inquiry is to improve the schools and to find opportunities to help teachers, principals, and superintendents in the task of training our boys and girls to become good American citizens. If, however, the main purpose of those who engage in any school inquiry is to exploit untried theories, to attract attention and acquire fame, to secure a large salary and, in order to appear to have done work to warrant that salary, to make radical and sensational recommendations, or if there is a purpose to belittle the men engaged in the work of teaching and supervising, "that is another story."

The New York School Inquiry had its beginning in a criticism of school expenses. The Board of Estimate was

not satisfied with the explanations of the need of money made in the presentation of the school budget. As financial authorities responsible for the tax levy and for expenditures, the members felt that they should have more detailed information and a clearer explanation of the needs of the schools than they had been able to secure. Many of the questions asked of the City Superintendent and the Board of Education in reference to the growth of the schools and the expenditure of money involved a great amount of statistical work which was of little value when done; and as far as the future needs of the schools were concerned the questions asked could be answered only by an omniscient being, able to state positively the increase and decrease of school population in each section of the city a year in advance. This inability to answer satisfactorily all inquiries in reference to the past and to prognosticate the school needs for the future with certainty, coupled with a complaint that is ever and everywhere prevalent, that the course of study needs radical revision, led the Board of Estimate to appropriate money and to select a committee to investigate the schools and school conditions.

The particular reasons why this inquiry attracted so much attention was the magnitude and complexity of the problem, the amount of money appropriated—a total of more than $100,000—the number and reputation of the experts called into service, and the advertising that this work received thru the daily press.

For a full year the schools were in a turmoil. The investigation began June 1, 1911. Soon the schools and school authorities were deluged with letters of inquiry, with requests for information on a thousand and one points, and for statistical tables on registration, attendance, retardation, promotion, elimination, mortality, etc. It was understood that all complaints and reports of grievances would be welcomed. For several months the time of the Committee was used apparently in gathering statistics and in formulating a plan of procedure. In the month of October, the Chairman on School Inquiry was called upon to assist

the Board of Estimate in preparing the school budget for the coming school year. He brought forward statistical tables. He proposed many questions to be answered by the school authorities. He showed such an utter lack of comprehension of the great problem before him, that the inquiry came near meeting an early demise. The dissatisfaction at the time was so general that it required much argument by the interested few, and long delays, to persuade the fiscal authorities to appropriate money for a continuance of the work after December 31. In fact, the Board of Aldermen vetoed the appropriation and the Mayor never approved it. From some source the funds needed for the completion of the investigation were at last secured and the inquiry was continued for six months longer.

The men selected to conduct the investigation were men of ability from six of our leading universities and from various other institutions, but none of them had had any extended experience in public school work. They all entered upon the task with enthusiasm, most of them with an earnest desire to make recommendations that would lead the fiscal and school authorities of the city to improve the school conditions.

The attitude of teachers, principals, superintendents, and members of the Board of Education was sympathetic. All assistance possible was rendered. All inquiries were promptly answered. All monthly and annual reports and statistical tables relating to the school department were open to the Committee. Even the filing cabinets, containing official and semi-official correspondence, investigations, reports and recommendations, were examined into in order to secure data that would shed light upon the problem. Nothing was held back or concealed.

These investigators had an open field; they had unlimited funds at their disposal; they were not restricted in time; they were free to map out their own plan of procedure, and at the close of the investigation they prepared voluminous treatises on educational theory and practise. The publication of these several reports, or abstracts, was

well handled by press agents—never was any war news better handled. Every unfavorable criticism was blazoned in glowing headlines. But this fact should be understood by the teaching profession—*no report, nor any intimation of what a report contained, was ever submitted to the school authorities before its publication in the daily press.* At every point the school authorities were apparently on the defensive and at a disadvantage. They knew little of the private conferences held and nothing of the confidential communications that were sent to the Committee. They were given no opportunity to reply to the complaints and to defend their action. These facts must strike the educational world as strange and indefensible.

Now that several months have gone by and sober second-thought has asserted itself, a few facts and conclusions from an insider may properly be made.

To the report as a whole much commendation is due, and undoubtedly much good will result from the suggestions offered. Many of the reports are clearly constructive and were prepared with the evident purpose of assisting the school authorities in improving school conditions. One part of the report, however—the Hanus-Elliott contribution—has met with almost uniform condemnation by the educational press of the country and by all superintendents and principals who are familiar with the public school conditions of this city. In no uncertain tones have they voiced their surprize at and disapproval of the findings submitted.

In the first place it is clearly evident that Messrs. Hanus and Elliott had little idea of the magnitude and complexity of the problem, either when they began their work or when they closed it. The problem was too big for them.

New York City has a larger school population than the entire population—men, women, and children—of any city in the United States, save Chicago and Philadelphia. Its school population is fifty per cent larger than that of the entire state of Massachusetts, including all cities and towns. Its average school attendance is larger than the combined

school attendance of Chicago, Philadelphia, Boston, St. Louis, and Cleveland. Or, again, the average school attendance in New York City is greater than the combined attendance of Washington, Baltimore, Pittsburg, Cincinnati, Detroit, Milwaukee, Minneapolis, St. Paul, Los Angeles, San Francisco, Seattle, Newark, Jersey City, Denver, New Orleans, Kansas City, and Indianapolis.

To show the complexity of the problem which must arise, one needs but to note the mixt character of the population, its continual shifting within the city limits, and the fact that during the past six years the percentage of increase in school attendance in the several boroughs has been: Manhattan, 5.08; The Bronx, 59.41; Brooklyn, 26.65; Queens, 38.83; Richmond, 21.06; or an average for the city of 20.34 per cent.

In addition to the 594 day elementary schools, 23 high schools with their several annexes, 125 evening schools, 250 vacation schools and playgrounds, there are 150 classes of mental defectives, 25 classes of anemic children, 14 classes of tubercular children, 28 classes of deaf children, 12 classes of blind children, 6 classes of speech defect children, and 2 classes of children with infectious eye diseases. To care for the regular and special classes of children in the day, evening and vacation schools, an army of approximately 20,000 teachers is required.

The school problems in this city are surely many and complex. And while the schools are far from perfect, they are in much better condition than would be inferred by reading the reports and findings of the Committee.

The unfairness of the Hanus-Elliott report is apparent at every point. Thruout the report there is evident a preconceived and doctrinaire point of view that fails to take in the entire situation and is more visionary than practical. It promulgates *ex cathedra* without suitable investigation their findings on the supervising force. Its makers evolve from their inner consciousness a panacea for all ills that the New York school system is heir to as they see it—the abolition of the Board of Superintendents and the sub-

stitution of a supervisory council which shall be made up of district superintendents, principals, directors, and teachers —the members of the present Board of Superintendents carefully excluded. How a large and unwieldy supervising council could do the work required, it is difficult for any but college professors at a distance and with no supervisory experience, to see. An *advisory* council, the Board of Superintendents and the Board of Education favor.

The utter unfairness and injustice of the report is evidenced by the fact that no recognition whatever is given to the Board of Superintendents for anything accomplished in improving the school conditions in the city during the past ten or fifteen years, or in organizing the schools and introducing special activities that have attracted the attention and excited the admiration of the school world. Thruout the report there is evidence of a determined effort to ignore commendable achievement and to besmirch the professional reputation of the men who have borne the burden and heat of the day, who have stood for what they deemed right and expedient. The report fails to note, or it belittles the great amount of work involved in the official correspondence, the investigations and reports on every conceivable topic, the preparation of courses of study and syllabuses, the organization of schools and special activities, the nomination, promotion, and transfer of teachers, questions on the kinds and grades of licenses, the admission, promotion, transfer and graduation of pupils, the selection of textbooks, attendance at committee meetings of the Board of Education, conferences with teachers, principals, members of the Board of Education, and citizens.

The growth of the various school activities in this great city has been as rapid as local conditions and available funds warranted. The Board of Superintendents has never asked or expected credit or public recognition for the work in organizing, extending, and supervising these activities. Its members have been content to work quietly and untiringly for the good of the schools, and to have all official communications bear merely the signature

of the Chairman of the Board of Superintendents. The members did expect, however, that any intelligent and thoro inquiry would give a fair statement of present conditions and the steps that led to them.

If the recommendation had come from men who had had experience in school administration, it would have had greater weight. Such men would necessarily have given a more intelligent consideration to the problems involved and some recognition of the work accomplished. Little ability is required to find fault; a great deal of ability and the wisdom of experience are required to outline a reasonable and workable plan of general improvement.

Professional etiquette alone would have restrained most men from making such a drastic recommendation as Messrs. Hanus-Elliott saw fit to make.

It is quite natural that men, presumably honest, fairly intelligent, and earnestly devoted to the good of the schools, men who have given the best of their lives to a study of the New York school problem, who have had a determining voice in the plans that have been inaugurated and developed for the improvement of the school system, who have seen good results from their efforts, tho regretting the evident short-comings, when they found that the chief point of the inquiry report was a recommendation that they be legislated out of office and thereby deprived of their reputation as well as their position—it is natural that these men should protest.

ANDREW W. EDSON
ASSOCIATE CITY SUPERINTENDENT OF SCHOOLS
NEW YORK, N. Y.

IV

THE COLLEGE AS A COMMERCIAL FACTORY

AN ANALYSIS OF PREREQUISITE DATA

It seems worth while now that educational institutions, methods and results are being subjected to so much criticism on the part of that recently arisen body of men whose mission in life seems to be to thrust perfection upon a reluctant world, to make mankind unwillingly efficient, to examine rigorously and in detail the conditions of the problem of educational reform, the data upon which such reform must be based.

The efficiency engineer on attacking the problem of the reorganization and standardization of a university, college or school, proposes that the institution in question be treated as a factory or a commercial plant. One may not acquiesce in this point of view and yet may be willing to accept it, temporarily, as a working hypothesis; but having accepted it one feels justified in demanding that the expert reformer shall adhere to the principles he has himself proposed.

Unfortunately, at this very starting point of the investigation the divagations of the expert begin. He proposes many and great reforms, points to laxity of method, failure to utilize available space, time and funds, convicts, or at least accuses, of lack of organization and coordination —in short, covers the educator with a mantle of shame. And when the repentant educator arises with a contrite heart to look upon his faults and correct them, behold, the expert reformer has forgotten his own premises and has neglected to investigate and formulate the basic data upon which must be built the reorganization of any business establishment.

In any factory the management knows, or is supposed to know, three fundamental things: first, what the product of the factory is; second, what the product has cost; and

third, what is the value or selling price of the product when completed or finished. Naturally, then, in the business of education one asks for the same definite information, not only as a basis for the business, reformed and improved into what the expert says it should be, but also as a foundation to the understanding of the business as it actually is. Until one has this information, and until one understands thoroly the educational system as it exists, one can by no means formulate plans for the organization of the educational system as it should be—from the business point of view.

The first question, therefore, is, what is the finished product of the educational factory? What is the product which is sold to the willing or unwilling customer? The educator confesses freely that he does not know, and maintains that he has not been informed by his critics. Under the present, perhaps one had better say the past, régime, the educational product striven for is the man (or gentleman, if one prefers) with a mind trained to processes of analysis and thought; to whom has been given some knowledge of and respect for the achievements of mankind in the past in art, in literature, in history and in science in its broadest sense; who has been inspired with ambition to help carry on the noble work of man, or who, failing in that aim either from lack of ability or lack of opportunity, is content to remain "a man whose hopes and aims may sometimes lie.....above the ordinary level, but to whom the ordinary level will be good enough after all if it prove a way of usefulness leading to no other." The educational product striven for was (the writer unconsciously and unwillingly drops into the past tense) such a young man, fitted to lead a broad, deep, full and useful life; for the sake of that life itself, or, in some cases, for the sake of that life as a prolegomenon to the life to come.

No pretense is made that this ideal was, or is, often achieved, that the finished product is perfect. But it is maintained that the educational finished product, on the whole, comes as near perfection as the finished product

of machine shop or factory. One can point to thousands of educated men who are nearer to perfection than a machine or engine which utilizes 10, 20 or 30 per cent of the energy with which it is supplied; to hundreds of thousands of educated men who have served mankind as faithfully and as long, with as little cost for repairs and as small a charge for depreciation, as the most perfect machine tool, lathe, or boiler that the scientifically managed shop can produce.

Two other things there are, nay three, which the expert critic fails to see, or, seeing, fails to remember. The factory rejects and destroys whatever part of its product is imperfect. The educational factory can not often so reject and can never so destroy. Its product, burdened with all its imperfections, must be sent out to play its part in the world. The "management" tries to know and to mark the pots which are flawless and the pots which are distorted and marred. The business customer who buys this pot for his use knows its weakness and its imperfections and prefers it to the perfect because it is less costly.

The second thing the expert fails to see is that in the educational factory the raw material from which the finished product is made is not, like that of the ordinary factory, homogeneous, uniform and constant, but is heterogeneous, variable, Protean in substance and form; and is to be made, not into a finished product of classes, of genera, of types, but into a finished product of individuals.

The third forgotten or unseen peculiarity in the educational factory process is that not alone the college or school fashions the product to a finish, but other influences, other "shops" take part in its formation. The church and the home mould and chisel it; it is distilled in the crucible of society; it is melted in the blast furnace of the world. This is all for the best, but it is not for the best that all this should remain forgotten or unseen.

Such is—alas! such was the product for which the educator strove. Now no longer must it be so. Now must he produce one hundred men perfectly adapted to the management of machine shop, factory or mill, and adapted

to nothing else; one thousand men fitted to become assistant manager this and deputy assistant that, and fitted for nothing else; one hundred thousand men fit to become an integral part of typewriter, loom or lathe, and fit for nothing else. What the expert reformer demands is men adapted to *his* business, rather than to the business of mankind which is life. And he expects the college or school-made product to be "finished," to require no more teaching, as if education stopt with the school and were not coterminous with the life of a man, coterminous with the life of a race.

There has been left to the last one feature of the educational product which differentiates it from any other that is known: the educational product voluntarily produces itself. The student, the pupil, is a living, conscious, active —and let us hope, willing—agent in his own education. What would the efficiency engineer do if the iron hot in the forge rose up and refused to be smitten? What, if the steel cylinder demanded that the lathe turn thrice as fast? The training of domestic animals is a simple, analogous case. How infinitely more complex is it to train the animal man!

These are the objections—perhaps not all—but, these are the objections to treating the educational as one treats the commercial factory product. Let us waive these objections, accept the college or school as a factory, and the product as a salable article, and proceed to the determination of our data.

We shall accept, as a working hypothesis, that the educational product is a man especially trained and fitted for some one definite pursuit or purpose to the exclusion of all others. Two other questions remain to be answered. What has the product cost? What is the value of the product, or what is its selling price?

In his book, *The proper distribution of expense burden*, A. Hamilton Church enumerates three elements in the cost of production. The writer will follow Church in general principles as he knows of no author who treats more ade-

quately the subject under discussion. The three elements of cost are:

1. Cost of workmen's wages and of materials; called prime cost.

2. Prime cost *plus* the expense of production incurred in passing thru the shops; called works cost.

3. Works cost *plus* expenses of commercial management and selling organization; known as inclusive, or total, cost.

For our present purpose prime cost consists of wages only as there is no raw material, strange as this statement may seem to one accustomed to meeting college freshmen. Moreover, there is no works cost exclusive of wages, since there is no machinery involved in the educational process, strange as this statement may sound to members of a college faculty. Our total, or inclusive, cost is thus made up of workmen's wages plus expenses of commercial management plus expenses of selling organization. Wages constitute the direct cost; the other expenses constitute the indirect cost and go into the overhead burden.

DIRECT COSTS: WAGES

Item 1. Salaries of the instructing staff.

This item may be subdivided into pay for (*a*) instruction, (*b*) administration, (*c*) research. Of these the first only (*a*) is direct cost of product. The second (*b*) goes into the overhead burden, or indirect cost, and should be distributed amongst the students whether or not they receive instruction from a particular instructor. Research (*c*) is a doubtful class. Strictly speaking it is not a direct cost, altho a student assisting in the research might, at the same time, be receiving instruction. From observation of prevailing tendencies the writer might suggest that class (*c*) be treated as advertising, and thus be distributed in the overhead burden to the whole body of students, as shown later on.

It must be noted that (*a*) can not be measured by classroom or laboratory hours alone. The reading of themes in English or other languages, the correction outside of class or laboratory hours of problems worked by the student

at home, conference hours definitely set aside for help to individual students, these, and perhaps other items, fall under (*a*). Also it may be noted that class (*c*) may be treated in an entirely different way, as a product of the educational factory; which thus produces two entirely distinct products, namely, the educated man and the research dissertation. The costs, both direct and indirect, would be determined for each class of product; and, of course, from this point of view, research costs would not form a part of the overhead burden. Usually it would be possible to separate the two departments of instruction and research in a given institution. Research students and professors would be classed together as productive workmen, the former as apprentices, perhaps.

Item 2. Honoraria to non-resident or occasional lecturers: these would be distributed equally to the various departments or courses of study. It would seem best that the number of hours of lecture be counted once for each department. In many cases the whole charge would form a direct cost of one department.

The first duty of the efficiency engineer who purposes to reorganize a college, is to analyze item 1, instructors' salaries, into its three constituents, and to determine the amount of each, in order to allocate properly both direct and indirect costs. This must be done for the separate departments, perhaps for subdepartments or courses, because, in the department of mechanical engineering, for example, one-third of the total amount of salaries may be allocable to direct costs, two-thirds to overhead; while in the department of Romance Philology, four-fifths of the amount of salaries may fall into direct costs and one-fifth into overhead. To average such widely divergent costs for the whole college would be, as any business manager would know, fatally misleading.

The reorganizer may propose as an alternative the complete separation of instruction and administration by the appointment of different men to each class. To this it may be objected that certain kinds of administrative work can be best done, perhaps, indeed, only properly done, by

those who instruct also. The decision as to what subjects to give and how to give them can be best made by those who teach the subjects; the determination of the standing of a student, the value of his work, and his future needs, can best be done by those who have taught him; cases of "discipline" can be best decided by those who have known the student intimately in classroom or laboratory; and this is administrative work. Moreover, the determination of the general policy of an institution of learning by an administrative body composed solely of men not engaged in teaching would lead inevitably to swift deterioration and fatal decay. These are the two horns of the dilemma. Let the reorganizer choose which he will.

INDIRECT COSTS

These are to be thrown into the overhead burden and properly allocated. By no means must this be done by taking the sum total of indirect expense and dividing this total by the number of hours of instruction in classroom and laboratory. This would be again to use the fatal principle of averages. Each of the following list of items must be analyzed into its constituent parts and the parts properly allocated to the various departments, subdepartments and courses.

Here another difficulty presents itself. Certain operations in a plant may be called unproductive. It is conceivable that the product might be perfect and complete without them. Proof-reading, which is made an expense of typesetting in printing establishments, is an illustration. Consider the case of a college or school where courses in language, history and literature are given to all students. These courses may be considered, for engineering students, as unproductive operations. The writer will pause long enough parenthetically to remind his colleagues that this is not his own, but, hypothetically, the business organizer's view.

Such courses must be separately treated, and that portion of their cost of instruction which is allocable to engineering students must be thrown into the overhead burden, while

the portion given to students qualifying as experts in language or history is wages, a direct cost. It must be determined what portion of the total belongs to each group of students, or else separate classes must be conducted for each group.

A tentative list of items which go into the overhead burden is here given, with some remarks in passing on the various items.

Item 1. Salaries of the president and other general administrative officers.

Item 2. Division (*b*) of item 1 of direct costs. In general this charge would have to be further subdivided into (*A*) general administration and (*B*) departmental administration costs. The former (*A*) would be distributed into the overhead of the entire body of students, that is, over all departments, the latter (*B*) into the overhead of the particular department in question. Moreover, in the case of heads of departments, a further division of (*B*) would seem necessary into departmental administration and departmental supervision or foremanship; but as both of these would go into the departmental overhead this further subdivision is purely formal.

Items 1 and 2 could probably be conveniently distributed in the overhead of the various departments on an hourly burden plan. To elucidate this plan let us assume the following simple case of a college composed of two departments, D_1 and D_2: Department D_1 has 10 professors, salary \$3000 each, serving 300 hours each per year; 10 associates, salary \$2000 each, serving 400 hours each per year; 10 tutors, salary \$1000 each, serving 500 hours each per year; D_2 has 5 professors, salary \$4000 each, serving 250 hours each per year; 10 associates, salary \$2000 each, serving 400 hours each per year; 5 tutors, salary \$500 each, serving 500 hours each per year. The salaries of the president and other general administrative officers amount to \$20,000 per year and may be distributed to the departments in proportion to the number of working hours, or may be divided equally between the two departments. In the case of all officers of instruction, administration time and instruction time are paid for at the same rate. Space forbids that our analysis be carried too far, otherwise consideration would be given to the fact that there are several grades of workmen, ranging in wages from \$1 per hour to \$16 per

hour. A student receiving his instruction from a sixteen-dollar man would cost more than one receiving the instruction of a one-dollar workman. In the opinion of the writer, however, this distinction should be otherwise made. He believes, in general, that *all instruction* time is paid for at the same rate, and that the higher salaries paid to higher grades of instructors are attributable to the fact that their administrative and supervisory time is worth more than that of lower grade instructors. The question is not a simple one.

Further assumptions can best be put in tabular form as follows:

TABLE OF DATA

Grade of workman	Department	Number of men	Hours of instruction	Hours of general administration	Hours of departmental administration	Cost of instruction, dollars	Cost of general administration, dollars	Cost of departmental administration, dollars
Professor	D_1	10	1000	1000	1000	10000	10000	10000
	D_2	5	1000	50	200	16000	800	3200
Associate	D_1	10	3000	500	500	15000	2500	2500
	D_2	10	3000	500	500	15000	2500	2500
Tutor	D_1	10	4000	500	500	8000	1000	1000
	D_2	5	2400	0	100	2400	0	100
Totals	D_1		8000	2000	2000	33000	16800	13500
	D_2		6400	550	800	33400		5800

Thus, the general administration costs are \$20,000 *plus* \$16,800, or \$36,800; of which one-half is allocable to each department. Therefore, the general administration overhead costs are:

For D_1 \$18,400/8000 = \$2.30 per working hour.
D_2 \$18,400/6400 = \$2.875 per working hour.

And the departmental administration overhead costs are:

For D_1 \$13,500/8000 = \$1.688 per working hour.
D_2 \$5,800/6400 = \$0.906 per working hour.

From which we obtain the total administration overhead costs, items 1 and 2:

For D_1 \$2.30 *plus* \$1.688, or \$3.988 per working hour.
D_2 \$2.875 *plus* \$0.906, or \$3.781 per working hour.

Returning to the enumeration we have:

Item 3. Rent: if property is owned this item would include interest on the capital invested in real estate and buildings, taxes, depreciation and maintenance of buildings, and insurance.

The writer will leave to the accountant the decision of the questions whether the capitalized value of real estate and buildings should be the original cost or the present assessed valuation, and whether the rate of interest on the investment should be high or low. In either case the item "rent" would be allocated to the various departments in the overhead burden.

On the hypothesis adopted, that the educated student is the only product of the college factory (research not being so treated) the writer can not agree with President Hadley[1] that "there is in the accounting of any university a large amount of undistributed overhead charges." There should be no charge undistributed. Rather should the university boldly face the fact that it is doing, and must always do, a "losing business;" that from the business point of view the cost of this student product is always greater than the selling price.

In considering the item rent the first suggestion which presents itself is that rent be allocated proportionally to the floor space occupied. This principle is unobjectionable when a department has exclusive use of floor space, but is open to objection when two or more departments occupy the same floor space simultaneously, or consecutively. In simultaneous occupation, as, for example, in the use of a library building, the floor space may be apportioned equally to the various departments, being treated precisely as item 1. In consecutive occupation the whole floor space should not be charged to each department, but each should be charged with a percentage of the space based upon the number of hours of use.

Thus, suppose that departments D_1 and D_2 occupy land and buildings on which the interest, taxes, depreciation,

[1] EDUCATIONAL REVIEW, January, 1913. "Methods of ascertaining and apportioning cost of instruction in universities."

insurance and maintenance charges are $50,000 per year. Assume the total floor space available to be 160,000 square feet, of which 100,000 are laboratory space used exclusively by D_1 during 6000 hours, while 11,000 square feet are used exclusively as a draughting room by D_2 during 4900 hours. It is assumed in both cases that the space is not available for other use, so that, practically, D_1 and D_2 occupy it during the entire working year. The remaining 49,000 square feet are used by D_1 and D_2 at different times, during 2000 and 1500 hours, respectively, as classrooms. Then the chargeable rent is divided into parts as follows:

To D_1 100,000/160,000 of $50,000 = $31,250

D_2 11,000/160,000 of $50,000 = $3437.50.

The remaining floor space is divided between D_1 and D_2 in the ratio of 2000 to 1500 so that there are chargeable to D_1 four-sevenths of 49,000 = 28,000 square feet

D_2 three-sevenths of 49,000 = 21,000 square feet

whence additional rent chargeable

to D_1 28,000/160,000 of $50,000 = $8750

D_2 21,000/160,000 of $50,000 = $6562.50.

Therefore, the total rent chargeable

to D_1 is $31,250 *plus* $8750, or $40,000

D_2 is $3437.50 *plus* $6562.50, or $10,000, and the overhead costs, item 3, are

for D_1 $40,000/8000 = $5.00 per working hour

D_2 $10,000/6400 = $1.563 per working hour

and the overhead costs, items 1, 2 and 3, are

for D_1 $3.988 *plus* $5.00, or $8.988 per working hour

D_2 $3.781 *plus* $1.563, or $5.344 per working hour.

In connection with item 3 it may be remarked that an allocation proportional to floor space occupied, even when modified as above, may be grossly unjust to one department as compared with another. A laboratory, for example, may require specially constructed, non-vibrating piers, which would add greatly to the cost of the building and in consequence to the annual rent charge. If such special construction should entail a total annual charge of a given

amount, this amount should be charged entire to the department causing the expenditure.

Item 4. Heat, light, and power: these may be purchased or made. If the plant is owned item 4 includes interest on investment, running expenses, such as fuel, oil, labor, etc., maintenance and depreciation, and insurance.

It is to be noted that item 4 should not, as is sometimes done, be distributed on the basis of floor space occupied. Portions of a laboratory may not be heated, the draughting rooms may be specially lighted, all the power may be allocable to the laboratory except x per cent used in running ventilating fans.

Assuming that heat, light and power are furnished to all buildings from a central station, and that the cost of transmission is the same for all buildings, the writer believes that item 4 should be charged to the various departments as follows:

(*a*) Heat on a basis of cost per cubic foot heated per hour.

(*b*) Light on a basis of cost per candle-power per hour.

(*c*) Power on a basis of cost per horse-power hour.

If electricity be used for both light and power, the percentage used for each purpose must be known. Item 4 may then be distributed in the overhead burden as may also

Item 5. Depreciation, maintenance and insurance costs for apparatus, furniture, etc., and the interest on capital so invested.

Apparatus and furniture used exclusively by one department are charged to that department only. Supplies would all probably come under this head. Apparatus, etc., used simultaneously by one or more departments are charged equally to the various departments. Apparatus, etc., used consecutively are charged on the basis of the number of hours of use by each department.

Item 6. Interest on capital invested in libraries and collections (exclusive of buildings and land), both general and special, maintenance, depreciation (if any) and insurance on same.

General libraries' and collections' costs should go into the overhead charge of all departments equally; special libraries, etc., into the overhead of the one or more de-

partments to which they especially belong, being equally divided among them.

Item 7. General office expenses: bursar's salary, salaries of clerks, stenographers, etc. This item includes also office supplies, stationery, etc., and is equally distributed over all the departments.

This distribution may be inequitable, but is customary in business management, and no better plan suggests itself. As in the case of other items so distributed, item 7 obviously bears no relation to the number of working hours of a department, nor to hours of "use," nor to floor space occupied. Doubtless in course of time expert accountancy will enable one to allocate such charges exactly, but until such allocation is accomplished for the commercial factory it need not be attempted for the educational plant.

Item 8. Wages of watchmen, janitors, etc.

Item 9. Advertising: (*a*), general, includes the president's reports, general catalogues, bulletins, and circulars, salaries of publicity agents, etc., to be allocated to all departments equally; (*b*) special bulletins, reports, etc., to form part of the overhead burden of the department advertised. Item 8 treated similarly.

Item 10. Athletic fields and tracks, gymnasiums, stadia, etc., if maintained and owned by the college: interest on capital invested in land and buildings, depreciation and maintenance charges, insurance, all to be distributed equally to the different departments.

The writer will pause here to say that it would not seem inequitable if, from the expenses of item 10, were deducted all receipts from the use of stadia, gymnasiums, etc., for public games, exhibitions and contests. On the other hand, it may be argued that the college receives more than the equivalent of these receipts in the value of the gratuitous advertising inseparable from such exhibitory use. But this is no reason why the college should not appropriate the "gate receipts" also, as business management implies to get as much as possible for as little as possible.

To be sure, we should have the anomaly of the product assisting to reduce the cost of its own production; of the "educated man," or the half-educated, sacrificing himself on the athletic field to make the cost of his education less. We should seem to be sailing perilously near the rocky

coasts of Utopia. Shipwreck upon item 10 threatens our argument, as also upon

Item 11. Dormitories, eating "commons," and similar institutions.

These undoubtedly contribute to the education of the student. They reduce the cost of education if they yield a net income, and increase the cost if they produce a deficit. Their costs are not a direct charge, evidently, and it would seem, therefore, that it might, perhaps, be best (the writer prefers here to linger in the haze of the subjunctive mood) to allocate them to the departments in the overhead burden. Such items, also, as scholarships and prizes immediately suggest themselves as falling in the same category. They are cost increasers, just as the dormitory is, usually, a cost reducer.

Let us try to analyze items 10 and 11, and their corollaries, more carefully. We find that the student who is being educated, and who, by hypothesis, is the "product" of the factory, is paying the cost of dormitory and commons. The product of the factory is also the factory's customer. Moreover, the student pays laboratory fees, entrance fees, diploma fees, tuition fees, and receives rebates or discounts in scholarships and prizes. The product of the factory is sold to the product itself. One may well stop and ask, is not this a *reductio ad absurdam?* Is not the whole argument based upon a false premise, itself based upon a falser analogy; namely, that because an educational institution is a body of men organized for a definite purpose of work with costs, it must therefore be identical with a commercial factory which is a body of men organized for a definite purpose of work with costs and profit? And because the latter produces tangible things, which can be counted, and weighed, and measured, evaluated, bought and sold, that the former, also, must so produce a thing, material, of the earth earthy, and evaluable in dollars and cents?

So it seems to the writer. And so it seems to the writer that the educational institution as a commercial factory is a snare and a delusion. Call the college a factory if you will, and declare that it produces and sells; but the product

is not what commercialism demands, is not even the ideal which we have described, for which the educator has striven, altho this ideal may be the resultant of the educational "process" upon the "material" man.

That which, in its lowest and baldest statement, the educational factory produces and sells is instruction or information; instruction in German, in mathematics, in chemistry, in law, biology, or physics. The factory's customer, he who buys, is the student. And to the dweller upon this low plane, there the matter ends. The customer buys. What he does with his purchase concerns not the seller. What the student does with the instruction he receives concerns not the instructor. This is the pupil and this the teacher from the commerical point of view. The cost of the product can be determined, the selling price is known, and the loss—it is always a loss—can be computed.

Neglecting all items in our category beyond the third, we have for D_1 overhead burden, \$8.988 per working hour; D_2 overhead burden, \$5.344 per working hour; D_1 wages, \$4.125 per working hour; D_2 wages, \$5.219 per working hour; D_1 total cost, \$13.11 per working hour; D_2 total cost, \$10.56 per working hour. So that for fifty students the cost per student per working hour is, in department or course D_1, twenty-six cents; in department or course D_2, twenty-one cents. A student taking twenty hours per week in course D_1 and fifteen per week in D_2, for thirty weeks a year, during four years, costs \$1002. He pays for what he buys: tuition \$600, laboratory fees \$80, entrance and graduation fees \$15; total, \$695; making a loss of \$307. Such information, if based on exact data, may be valuable, but does not mean that the college should be closed, its halls converted into automobile factories and moving picture shows.

Moreover, if we raise ourselves above the plane of commercialism, what is it that we see? First and foremost, that it is not a matter of indifference to the seller what use the buyer makes of his purchase. The knowledge how to make a high and noble use of the instruction received is

the most precious part of a student's education, the pearl beyond price which the educational factory sells; and, in the second place, that which, from a higher point of view, the educational institution strives to produce, and in a measure succeeds in producing, is information, knowledge, learning, wisdom, honorable ambition and mental discipline, intellectual pleasure, power and restraint, the "degree," if you will, and social standing; a product of which in its totality it may be asked,

> "Hast thou seen it ever anywhere,
> Time's twin-born brother, imperishable as he
> Is perishable and plaintive?"

This product, or such part thereof as he is able, the customer, the student, buys, paying for it in fees, but not in fees alone. He pays in energy, industry, application, perseverance, interest; pays with intangible gold for intangible goods, for the patience, sympathy, travail and self-abnegation of the teacher; each striving to make his giving most generous and full. Commercial management may deem the costs excessive and intolerable, may think the price paid vain, and may indulge in the "laughter which is raised at the expense of the soul that has descended from the light of a higher region." But the educator, grown, thru long years, accustomed to reproach, may be content to reply,

> "And these things nowise move me, but I know
> Foolish and wise men must be to the end,
> And feed myself with patience."

L. MAGRUDER PASSANO

MASSACHUSETTS INSTITUTE OF TECHNOLOGY
BOSTON, MASS.

V

PROFESSIONAL TRAINING OF SCHOOL OFFICERS

The direction of schools and the institutional training of children is often described as professional service. Indeed statements of this import are a commonplace in educational discussion. The analogies existing between the management of schools and the practise of law or medicine have been indicated with logical thoroness, and it is not surprizing that teachers and school officers should be imprest with a style of argument which brings their vocation into favorable comparison with callings possessing great prestige and a large measure of public esteem. The prevalence of doubters, not to say cynics, unfortunately makes a complacent acceptance of the comparison difficult. This critical attitude does not so much appear in the great body of school patrons, who do not fail to render some degree of respect to the calling, but rather among those who might be supposed to know, the members of the standard professions themselves, and notably among those "professors" who formally lay claim to this title, the members of college and university faculties. It is this unwillingness on the part of the historically professional classes cordially to share their dignities with the educator in the lower schools that leads to the disquieting thought that perhaps after all the professional analogy is not all that it might be.

It should be possible to reduce the difficulty to intelligible terms. Do the marks and signs of genuinely professional effort in fact characterize the activities of those who care for children in schools? A profession, one learns from Murray's English Dictionary, is "a vocation in which a profest knowledge of some department of learning or science is used in its application to the affairs of others or

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in the practise of an art founded upon it." Two conspicuous marks of the profession, not contained in this definition, are an avowed subordination of the interests of the calling to the public good, distinguishing it from commercial activity, and a degree of fraternalism among its members, subserved by a formal code of ethics, not usual in ordinary occupations. Now, whether or not the institutional care and culture of childhood and youth up to the present point in its history deserves a professional designation, there can be little doubt of its possessing in a high degree the possibilities of a profession. This may be urged in the face of a view still current which limits the necessities of "school-keeping" to the rudiments of knowledge, some common sense, and sympathy for children. For the ends and purposes of education are not such as come by nature or by accident, the phenomena of organic growth have already taxed research to its utmost, while the difficulty of the art is apparent to anyone who rigidly measures the effect of any well-defined teaching procedure. The need of professional solidarity and a nice regard for the public welfare speaks for itself.

The question is, however, not one of future possibilities but one of present fact. Is the quality of the service comparable to that of the standard professions? Are the schools conducted in a really professional way? The reply to be made here is in the negative. It is the aim of the paper to urge that the prevailing conditions of entrance to the calling of themselves make a genuinely professional handling of educational problems impossible, and to enter a plea for a reconstruction of these conditions along truly professional lines. The discussion is limited to the training of school officers, partly for convenience, but more especially because, if it exists anywhere, professional expertness should be found to characterize the labors of persons permanently associated with the schools as their responsible supervisors and directors. The formal training of school officers is isolated for consideration with what seems sufficient warrant. It seems justifiable to measure

the quality of a service or an occupation by the kind of preparation leading to it, because history has made axiomatic that only under the most exceptional circumstances do men rise of their own unaided efforts to those levels of endeavor, properly to be described as professional, without profiting by the systematic study of the world's wisdom in these directions. And tho it may happen that an informal apprenticeship may still supply the necessary training in places, inevitably the tendency is to gather this wisdom into curriculums and disciplines in professional schools.

The vocational status of the school officer may then be safely gauged, in general, by the character of the formal preparation which so fundamentally conditions it. Because the curriculums of higher institutions of learning show three types of organization, it is proper in advance to place the professional curriculum among them. A professional curriculum is necessarily unlike either a liberal arts or a research course. The first has for its object the liberalizing of the mind and a general discipline of its powers, and is consequently fitted to the nature of individuality by means of electives within broad limits. Research demands a certain foundation in fundamental subjects, and especially a mastery of the methods and appliances appropriate to the successful solution of the problems on the frontier of a field of knowledge. The professional curriculum, on the other hand, aims consciously at the control of a practise or technique, often varied in its scope, but no less definite on this account. Whereas the test of proficiency in research is the independent discovery of new truth, the test in the practise of a profession is skilful employment of ascertained truth in the reduction of familiar social problems.

These lines have been drawn clearly by Mr. Flexner in his study of medical education. With reference to the liberal studies his words are: "The professional and cultural standpoints, tho obviously overlapping, are not identical. The professional purpose involves greater concentration, is on the lookout for definite correlations, and

steers toward an evident practical goal. The medical curriculum possesses a certain organic unity in virtue of the fact that each of its parts does the same thing. The college as college is indifferent to the ultimate practical bearing; the medical school can not afford to forget it."

The relation of professional study to research is implied in the following: ..."medical education is a technical or professional discipline; it calls for the possession of certain portions of many sciences arranged and organized with a distinct practical purpose in view. That is what makes it a 'profession.' Its point of view is not that of any one of the sciences as such."

In the context Mr. Flexner shows that all this may truthfully be said without, in any way, doing injustice to the importance of research to professional practise, or to the downright necessity of a critical and experimental attitude on the part of the practitioner on his daily rounds.

If, then, the management and supervision of formal education in schools is to be regarded as a profession, as it is universally declared to be, there must be a practise for which a professional curriculum is the indispensable preparation. But what is this practise? Definitions of education are legion, but one looks in vain for a well-defined line of activity of such high social value and scientific character as to offer solid ground for comparison with those of the standard professions. There seems to be no escape from the logic of the matter. The direction of schools lacks the first requirement of the profession, a fixt category of social problems with which a special technique is associated. School principals and superintendents make their duties largely at pleasure, or meet the exigencies of their situations as their measure of good sense or prudence determines. A conscientious person could not satisfy a professional ideal because no ideal exists. If one turns to the writings on school management with the expectation that at least worthy conceptions of these offices exist on paper, the reward is a half dozen articles and chapters outlining a

set of duties appropriate to a fairly efficient clerk or caretaker. A capable medical man or engineer might well be pardoned some reticence in acknowledging these descriptions as those of members of the professional brotherhood.

Lacking concrete models, one may reasonably indulge in an imaginative picture of what the future school officer is to be if he lives up to his professional pretentions. He works with growing minds and will therefore be an applied psychologist. Some of these minds will be aberrant; he will be in part psychiatrist. For a large part of the day he is responsible for normal physical growth and for the prevention of deviation and disease; some part of him will be hygienist. The institution over which he presides fits for practical living under complex modern conditions; he must then be economist and applied sociologist. The complexity of his means and agencies demands the equipment of an efficiency expert. Finally, the controlling aims and purposes of education are in large part cultural and ethical. He must, thru all his special duties, carry the viewpoint of a humanist and a gentleman.

There is no harm in the fact that this pictures an ideal out of all likelihood of immediate realization. It is barely possible that educational management is destined to be the most trying of all expert service. The real issue is whether this ideal office is a necessary and possible one. That it is necessary is evident from a consideration of the very serious demands being increasingly made upon education as a force in modern society from every angle of present-day thought. Its possibility rests in the first instance upon the willingness of communities to support persons whose ability and training are commensurate with the importance of the enumerated functions. Happily it may be said that American communities have not yet failed to supply themselves with anything they have been persuaded is really essential to the full usefulness of their schools. But the acceptance of such school officers must

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wait upon their creation, so that their actuality depends ultimately upon the training institutions.

By way of illustration and in order to reduce a vague general contention to workable terms, the writer has ventured to set down a list of duties which may serve tentatively as a description of the practise of a principal of elementary schools in an average American community, and to indicate what seems for the moment to be an appropriate training for these duties under prevailing conditions. This is followed by a characterization of the training actually existing in those institutions claiming to give professional training for school officers. The several groups of duties are asserted to be:

1. Those having to do with the interpretation and use of the course of study;
2. Those having to do with the distribution of normal pupils (attendance, retardation, acceleration, elimination, grading, promotion, and individual training);
3. Those having to do with the supervision and distribution of teachers;
4. Those having to do with the hygiene of school conditions;
5. Those having to do with exceptional cases;
6. Those having to do with school equipment, costs, departmental and community relations.

For each of these groups a description of a suitable training is attempted in the succeeding paragraphs:

1. Those duties connected with the course of study require for their successful performance a sympathy for and an insight into the several departments of culture and skill represented by the elementary and grammar-grade branches. Unfortunately this minimum is not the possession of all school principals. Temperament and the accidents of education seem to make some partiality for particular studies not unusual. Even ignorance of important branches is not remarkable. Altho the study of these elementary subjects need not be a part of a professional curriculum, perhaps some oversight of the student's selection of liberal courses would be advisable. The teaching of each of the elementary branches has had a respectable history, and today has a certain status because of it, known as its "special method," which should

be the familiar possession of anyone supervising elementary instruction, together with the results of what exact and critical investigation has thus far been made under the name of experimental pedagogy. This last in turn calls for a working knowledge of educational psychology and the more fundamental general psychology. Whatever may have been the views of educators and psychologists in the past as to the educational usefulness of training in the technique of the psychological laboratory, recent developments in the experimental study of learning processes have removed the matter from debate. Not only is the discipline of the laboratory necessary to the understanding of many of the processes of the school room, but even the intelligent reading of so representative a book as Huey's *Psychology and pedagogy of reading* presupposes it. Some part of this laboratory experience must be had with children, for it becomes evident that results gathered with adults as subjects under the usual laboratory conditions can not be carried into direct application with children of common-school age. The usual practise-teaching requirements for the teaching certificates are scarcely a substitute for this type of study. At best this gives a familiarity with school room conditions and procedure analogous to the introductory work in the laboratory preliminary to systematic study. Experimental teaching has been used to designate the advanced type of work with children. Inasmuch as teaching results must be found by class, section, age, grade and sex, analytical and critical methods must be supplemented by a fair degree of skill in the use of statistics, with sufficient practise on concrete problems to equip a school officer for an accurate application of them on the assumption of his office. The mathematics prerequisites to the course in statistics may perhaps properly be assigned to the liberal period of study.

2. Those duties having to do with the distribution of the normal school population call for a close acquaintance with the mass studies which have been made on such topics as elimination, retardation, grading, promotion, etc., an

acquaintance which can be had by those only who can follow in detail the mathematical processes employed in them. This knowledge is required again for the classification of the school population which will become the charge of the student as a school officer. An understanding of the causes operating in these directions is to be derived from the interesting new field of study characterized as individual psychology, a study which includes as components the practical phases of child psychology and child study, and rests upon general psychology. Very important contributing factors in the making of school groups are social and economic, treated in the division of the social sciences known as social economics, which may properly include the study of vocations and vocational guidance. The adequate handling of school groups requires finally a knowledge of that valuable experience which has been gathered in various places in connection with experimental efforts to provide, by means of revised promotion, grading, instruction schemes, and reorganization plans in general, greater adaptiveness of the school machinery to the needs of individuals.

3. A sympathetic and efficient direction of teachers is hardly possible without a knowledge of the training they receive and the qualities that have been found essential and desirable in them. This would be had in part from a consideration of those studies which have approached this topic inductively, along with some direct effort to appraise the efforts of teachers at work. One purpose of the class test and class experiment, as these are taking form, is for the estimation of teaching results. This purpose in the investigation of classes calls for special attention, and makes further warrant for the skill in statistics and the first-hand knowledge of teaching and learning processes discust under experimental pedagogy and experimental teaching.

4. A consideration of those duties of the principal which deal with the hygiene of school conditions, and those of the succeeding group dealing with exceptional cases,

raises the difficult and delicate question of the amount of physiological and anatomical knowledge which may be insisted upon with due regard to the necessities of the actual school situation and the sensibilities of the medical profession. Perhaps the future holds the possibility of an expert educator who is also partly medical man. Instead of turning the schools over to the doctors, as Dr. Sidis would have it, it is conceivable that medical science may be turned over in some serious part to the school men. However this may be, it need not be overtaxing the school principal of the present, or the indulgence of medical men, to expect the school officer to preserve wholesome conditions about the school population at large and to oversee the physical needs of children by something more than rule of thumb. The principal should be able, at least, to detect common symptoms and to refer to the parent or physician conditions which threaten the health of individuals or the community. Responsible medical diagnosis need be no part of the school officer's business. It seems obvious that the future principal should learn in an authoritative way, and not from weak dilutions in teachers' manuals, those facts and principles which characterize the physical growth of children and youth as such, and so be in a position to make a proper balance in the expenditure of energy in the programs of individuals and classes. Just what amount of anatomical, physiological and hygiene training is requisite for these moderate requirements of the present, and just how it is to be imparted, is not for the judgment of a single mind, but may be left to the discretion of educators and medical men easily to arrange when they shall seriously concern themselves with the matter. Those architectural, sanitary and hygienic appliances and principles which have taken form in connection with the construction of school buildings and their practical operation should of course be studied, if possible, from first-hand acquaintance.

5. The group of duties gathered together with reference to exceptional cases are of such difficulty and urgency as

to bring of themselves the principal's office well upon the professional level if they are adequately attended to. These may more readily be assumed by the school officer, for the reason, in part, that they imply an application of the science of psychology, which is acknowledged to be basic to all educational endeavor, and in part, because there is as yet no well-organized professional effort to dispute the field with him. The equipment of the principal for the duties of all the preceding groups is essential to the handling of exceptional cases, but several things in addition seem needful. It is perhaps proper to emphasize in this connection the study of the psychology of instinct, emotion, and will, with their pathology, altho this would properly fall within the limits of educational psychology. The structure and growth of the nervous system is a like topic, deserving more attention than it usually receives in courses in psychology, both as an aid to this science and to the understanding of mental deviation. Individual psychology is again in demand. But what is especially desirable is practise in the use of the diagnostic tests, of pedagogical as well as mental status, the formulation of which has been begun within recent years with encouraging promise. Those institutional provisions for the exceptional child in the form of special classes, parental, and similar schools would form a logical part of the study of this general topic. The psychology and practical uses of play would apply to the normal groups quite as well as to those now under consideration.

6. The duties of this group are practically the ones which at present constitute the major part of the office of school principal, altho it can not be held that they have been performed generally with professional distinction. Uncertainty and unwisdom in the use of the school plant have been urged too much to make further insistence necessary. The light in which the school officer works with school books and school equipment seems to have emanated in the main from the doubtful sources of the advertising media of commercial houses. The exact esti-

mation of costs has been impossible for lack of knowledge of exact methods of measurement for the purpose. An educational museum and school-book library would bring the prospective school officer into direct contact with many of the facilities employed in and recommended for schools, which could be supplemented by a supervised system of visiting. But here, as in the practise phases of all the activities of the principal, a laboratory school, well correlated with the psychological laboratory, would seem an indispensable part of any plant for the training of school officers. The requisite knowledge of school law and local school organization is now a usual feature of the training.

Whether this or a similar array of activities shall be undertaken in a spirit of common sense and liberality will depend, doubtless, in largest part upon personality, which is perhaps chiefly a matter of selection of candidates on the part of the training institution, altho discipline for these qualities is not to be despised. A proper regard for the body of modern culture is to be had only from that generous contact with its varied phases it has been the avowed purpose of the liberal arts training of higher institutions to provide, a training from which no professional curriculum can justly be divorced. The biological setting of man and his education calls for a solid course in biology and the social and metaphysical implications should be indicated by a sufficient inclusion of social psychology and philosophy. The place of the elementary school in democracy is to be understood from a study of its history and its interrelations with other formal and informal agencies. All this may be conveniently referred to as the philosophy of education, a division of the field of education which should guarantee a liberal professional viewpoint, only to be unkindly criticized when it is offered as the substance of educational training rather than an essential ingredient.

The course as outlined may seem excessive in amount. It is estimated that five years above the high school would accommodate it comfortably, and that its successful con-

clusion would be marked by some professional degree as that of A.M. in education. In California this amount of training sets the limit for the high school teachers' certificate. An equivalent requirement in amount seems not too much for the school officer; in fact, the number of persons proceeding this far in educational training seems to warrant this minimum. Assuming 120 units of credit to be about what is usual in American universities for the first advanced degree, it is assumed that about one-half, or 75 units of credit, should be assigned to liberal study and the pre-professional courses, and the other half to the strictly professional training.

The outline is offered as a concrete single example of a professional course in education. The unlike needs of high school principals, of college and normal school instructors, and of supervisors in special branches, would require important modifications of any plan devised for elementary principals. The curriculum for school superintendents would logically presuppose some such course antecedent to the study of the larger administrative problems, whose proper solution depends upon a mastery of the detail of the work of the lower school officer and the teacher. One of the lesser anomalies in the present conception of education as a profession is the curious assumption, not usual elsewhere, that the higher administrative positions may properly be occupied by persons unacquainted with the detailed service constituting the essence of the profession's function.

In the light of these considerations, having for their aim the comparison of the work of school officers with lines of activity freely accredited as professional, it is interesting to note the actual character of the training of school officers as this is evidenced by the descriptions of the training offered in the departments and colleges of education of the universities of the country. Printed statements of academic conditions are notoriously uncertain data upon which to base inferences, besides being difficult of interpretation. However, with the aid of intuition and some

first-hand acquaintance with several such institutions, certain propositions are set down with the assurance that they are at least not unfair to the situation as a whole. They are derived from a survey of some thirty-seven catalogs of representative universities in the country in which the work in education forms a serious part of the formal activity of the institutions. Incidentally the principal discussions on the history and place of education as an academic subject have been consulted. The propositions follow:

The work in education in American universities is universally regarded by those who conduct it as professional in aim and purpose. The word professional is very generally employed in the descriptions.

Altho the energies of these departments are still largely directed upon the training of secondary teachers, the disposition to train school officers is plainly in evidence. Some 30 of the 37 catalogs consulted either make specific reference to such officers by name or very plainly imply such reference.

Thus notwithstanding one looks in vain for any consensus whatever as to what constitutes professional training for such officers. This may be due in part to the small size of the group looking forward to the management of schools and to differences in the previous training and experience of such persons, necessitating an individual treatment of their programs. But taken with other evidence it lends support to the conclusion that it signifies chiefly the absence of a clear conception of the future work of school officers. Characteristic expressions in the catalogs are "appropriate opportunity," "exceptional facilities," "as each case may demand." One institution insists that students select some one aim of the several listed and consult instructors with this aim in mind. Another states that courses are arranged to meet individual needs but that ordinarily prospective school officers take some twenty-five units including seminar or advanced courses in several important branches underlying educational management. Election of studies by the student, with approval of deans or instructors, seems to be the practise generally prevailing,

not only for the liberal courses but for the professional courses as well. Election is doubtless limited in many institutions because the number of courses is small enough to permit a student in education to take all that are offered.

It may be observed in passing that the principle of election has certain positive limits as applied to professional training. It assumes that students may be trusted to select what best prepares them for their future labors, an assumption which seems to beg the whole issue of professional training as such. In the curriculums of schools of medicine, law, amd engineering, election is very greatly circumscribed, the options outside of the liberal courses being chiefly among different types of specialized professional activity.

This same uncertainty is apparent in the grouping of the school positions for which training in education is preparatory. Where these positions are enumerated they are given as superintendencies, high school and grammar school principalships, instructing positions in normal schools and colleges, the supervision of special branches, high school teaching and elementary teaching. It is quite usual to segregate the high school teaching and the elementary teaching, when this last is prepared for in universities, and to place all the others in one group as the more responsible educational positions. One gathers that the members of this larger group are thot of as having needs in common. Aside from this, the different educational positions are distributed in sub-groups in almost every conceivable combination without any apparent central tendency. This matter of grouping has, of course, slight significance. It is referred to merely as one additional sign of the prevailing lack of precision in the conceptions of educational training.

It is practically impossible to say anything definite of the amount of work required of prospective school officers, whether they take the bachelor's or the master's degree, so unlike are the statements from the different institutions.

For the first degree it would seem that students in education, regardless of the particular kind of position for which they are preparing, are required to have from ten units of credit as a minimum to some forty-five as a maximum. Undergraduate study in education is apparently determined mainly by the university requirements for the arts degree. From twenty to thirty units would seem to be the range within which the larger number of institutions fall. The master's degree is similarly governed in the main by general university regulations. Prospective school officers who stay for the fifth year presumably take a considerable part of the work of this year in education. It is probably safe to say that graduates of universities who take official positions in school systems have an amount of professional training very much less than that demanded in the training of the standard professions.

There is very little evidence of fundamental courses in the pure sciences underlying education. Instructors in education are, generally speaking, in the habit of giving what is regarded as necessary in these subjects in connection with their own courses. Psychology seems to be an exception. A rather general demand appears for this science as a desirable and even a requisite preliminary or accompaniment of the educational courses, so that it may be regarded in some degree as an accepted part of the professional training in education. This is true of philosophy in a smaller degree. Biology is alluded to in a case or two as "desirable." In general, few, if any, prerequisites exist for the study of educational aspects of the more abstract disciplines. Educational psychology with little introductory psychology, educational hygiene without preliminary study in anatomy and physiology, educational history without prerequisites in history, educational administration independent of economics and politics, the philosophy of education irrespective of other philosophical discipline—this seems to be the situation if one may depend upon the evidence of the catalogs. This is surely an extraordinary state of affairs. For, in so far as education is a science, it

is such by reason of its application of the pure sciences. This is the avowed general opinion. The contention made occasionally in earlier years, to the effect that education has a field in its own right coordinate with the other sciences, has fallen of inherent absurdity. Education is a science in the sense that medicine is; it consists of "certain portions of many sciences arranged and organized with a distinct practical purpose in view." If instructors in education are able to impart in their brief courses, along with the direct applications to practise a sufficient basis in the underlying studies, it bespeaks a very remarkable pedagogical talent or inevitable shallowness. It may be that much of the adverse criticism under which education as an academic study labors is bound up with this situation.

In an earlier paragraph a practical distinction was drawn between professional study and research, as these are organized in higher institutions of learning. It is plainly evident that, whatever its stated aims may be, educational work in universities is modeled upon and follows the research tradition. Apart from the facts of the case this is perhaps what is to be expected of a subject that sprang from philosophy and still is intimately associated with it in many places, when it is not regarded as a sort of poor relation. A survey of the catalogs leaves the impression that the educational curriculum is fashioned to culminate in a research degree. Specialization in knowledge rather than professional proficiency in an applied technique is the presumptive outcome. Thus it may happen that the mainstay of a school officer as he assumes his duties is a thesis or dissertation on the educational views of Kant, or some similar refinement in another direction. This may be compared with the situation in medical education which appears from the following extract taken from the catalog of a medical school: "Time spent in candidacy for the degree of Master of Arts or Doctor of Philosophy will not be counted toward the degree of Doctor of Medicine."

This acceptance of the ideals and methods of research

is indicated again in the division of the field of education for the purpose of specialization, where such division is made. The usual subdivisions are The History of Education, The Theory or Philosophy of Education, Educational Psychology, Educational Hygiene, Educational Administration, Educational Method and Organization (Elementary and Secondary). It is evident that the demands of any actual school position involve a balance of all these departments, or rather an integration of topics from each of them with reference to educational routine in some concrete form. Specialization in any one of these fields is not the first desideratum, but rather a solid basis in the facts and principles underlying educational practise as it is actually carried on. It is not contended that no effort is made to have advanced students in education made acquainted with these several divisions of the field, or that a failure to enter upon each of them in some degree is likely; it is felt that the matter is not systematically attended to. One result is that one may meet with Doctors of Philosophy in Education occupying school offices with scarcely more than the rudiments of psychology or some constituent study in the general field. This seems to imply either that the constituent study is not indispensable to educational efficiency or that a formal training in it is superfluous.

8. The most flagrant violation of professional standards in the training of school officers remains to be mentioned. It is the very general, almost universal devotion to books and lecture courses and the corresponding neglect of laboratory and clinical training, to employ the language of medicine. This is the more reprehensible in that one of the primary canons of pedagogy urgently advanced by professors of the subject in their writings and utterances, makes doing the chief approach to learning. Two or three institutions require candidates for advanced degrees to have had successful experience in teaching, but apparently it is possible to enter upon the management of schools from training institutions without previous teaching of any sort, or a very small amount. Perhaps

it might better be stated that training institutions are willing to accept teaching proficiency on hearsay rather than by a test of their own, in view of the fact that advanced students in education often have done some teaching. Practise teaching is not in point, for even where this is systematically provided for, it consists of a sort of probationary and preliminary trying out of the candidate and not that protracted and rigid discipline which characterizes the laboratory and operative training in the better professional schools. Hopeful mention of laboratory opportunities and experimental teaching is made in a few of the catalogs. One gathers that this is not well established and that it is elective. All this gives support to the thought of the previous paragraph, to the effect that educational study follows in the wake of research in literary materials and has not measured itself against recent developments in strictly professional training. An extract from Mr. Flexner's study already mentioned may serve to press the point: "On the pedagogic side, modern medicine, like all scientific teaching, is characterized by activity. The student no longer merely watches, listens, memorizes; he *does*. His own activities in the laboratory and in the clinic are the main factors in his instruction and discipline. An education in medicine nowadays involves both learning and learning how; the student can not effectively know, unless he knows how."

In concluding a statement, whose suggestive and tentative character may have been obscured by a dogmatic form of expression occasioned by necessary brevity, one final allusion to the much-abused medical analogy may be pardoned. We are told by Mr. Flexner that the American Medical Association was formed in 1846 committed to two propositions. One was "that young men received as students of medicine should have acquired a suitable preliminary education;" the other, "that a uniform elevated standard of requirements for the degree of M.D. should be adopted by all the medical schools in the United States." That training in education at the present time very urgently

needs the application of the corresponding propositions the facts seem abundantly to show. Dare one infer from this that professional training in education lags behind medical education by some sixty-five years? In any case, there can be little doubt of the very great desirability of earnest concerted reconsideration of the whole question. It may be that some one of our numerous associations of educators will feel called to attempt a service to education similar to that rendered the practise of medicine by the above-mentioned medical society.

PERCY E. DAVIDSON

LELAND STANFORD JUNIOR UNIVERSITY
PALO ALTO, CALIFORNIA

VI

OCULAR DEFECTS AND THEIR RELATION TO THE HEALTH AND WORK OF THE STUDENT

Within recent years there has been a continual improvement among our colleges and universities in the supervision of the athletic activities of undergraduates, and in a number of institutions there is exercised the larger function of providing medical advice, in addition to physical culture, for the entire student body. At some places these advantages are enjoyed by the student thruout his college course; at many, however, such assistance is very limited. In thus guarding the health of their young men and women our institutions have assumed a certain, considerable responsibility, the discharging of which becomes the more difficult as this service is made more efficient. The work of the medical examiner's department is heavy, but it yields results of great value to the student and offers problems of interest to the physicians; among these problems, those having to do with ocular effects are very important, and it is to some of these that I wish to direct the reader's attention.

Much has been said about the effects of school life upon the eyes. There can be no doubt that the work of civilizing mankind has been a powerful factor in the astonishing increase of ocular defects. Many forget, however, that the eyestrain resulting from such defects can in turn be the cause of ill health eventually, by producing functional disturbances in various organs, thus lowering the bodily resistance to agents that produce actual disease.[1] The occupation of the student, namely, the pursuit of studies during a number of years, is directly dependent upon the use of

[1] Medical literature, of the past decade especially, is replete with illustrative cases, but the far-reaching effects of refractive errors have been most ably set forth in the extensive writings of Dr. G. M. Gould.

eyes, which, as will be shown, are ametropic in most cases, that is, not normal in their refraction of light.[1] It can be confidently affirmed that eyes handicapped by these refractive errors, usually of low degree, are almost solely the predisposing cause of the occupational diseases of students. There is a growing impression too, that lateral curvature of the spine is important as a cause of nervous strain. This deformity is present to the extent of 85.6 per cent among our undergraduates. As will be seen later, it is closely associated with refractive errors in its origin, tho it has other causes.

In this paper I have not set out to trace all human ills to ocular defects, as some are unjustly accused of doing, but I desire to consider candidly the following subjects: (1) some fundamental facts about ordinary ocular defects and their correction; (2) the prevalence of refractive errors, their effects upon vision, and the origin of "squint;" (3) the symptoms of eyestrain—(a) how they originate, (b) what they are, (c) the problem of their relief; (4) the deplorable condition of refraction work in this country; (5) the relation of eyestrain to health and success.

In order that the reader may better appreciate what is said later in the paper about optical defects, their results and treatment, a few definitions will be given at this point and some simple facts in physiological optics will be reviewed.

To obtain distinct vision, it is necessary for the light rays coming from any object to be focussed sharply on the sensitive plate, the retina, of the eye. This focussing of the rays is carried out by several structures, particularly

[1] In another paper ("Examinations of the Eyes of College Students," *The Medical Record*, Aug. 3, 1912), I have published our methods and detailed the findings in our eye tests (4777 in number during three years preceding 1912). The statistics are merely qualitative, representing diagnoses and not exact measurements. In practise the following steps are carried out with each eye:

(1) Inspection for external signs of disease; (2) determination of visual acuity by means of test letters; (3) examination for refractive errors—myopia, hyperopia and astigmatism; (4) tests for imbalance of the extra-ocular muscles; (5) testing the power of accommodation.

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by the cornea, or front, transparent portion of the eye, and by the crystalline lens, which lies just behind the pupil. Some refraction of the light rays also occurs in the contents of the two chambers of the eye, in front of and behind the iris and lens.

In the myopic, or near-sighted condition, the eye is too long and the image is formed in front of the retina when vision is directed to a distant object. Hence, there is blurring and indistinctness of sight. If the object is brought near enough for the image to fall upon the retina, vision may be distinct, providing it is a simple myopia, that is, one not complicated by the condition known as astigmatism, to be described presently; even then the image may be pretty sharp as a result of reflex constriction of the pupil. A point of importance is that in thus obtaining clear vision by holding the object near to the eyes the muscles that are ordinarily brought into action in focussing are not subjected to great strain in simple cases of myopia, and for this reason the trouble is often overlooked. The condition is corrected by concave glasses.

In hyperopia, or far sight, a quite different condition obtains. The eye is too short, or too small, and rays, even from distant objects, focus behind the retina. It is necessary in this instance that the lens of the eye become more convex to converge these rays upon the retina. It was shown a good many years ago by the celebrated scientist, von Helmholtz, that this increased convexity of the lens, in the mammalian eye, is brought about by contraction of certain internal ocular muscles, known as the ciliary muscles. They are so arranged that when they contract they lessen the tension on the ligament that is attached to the lens and to the region of the ciliary muscle and the lens then bulges forward by virtue of its own elasticity. This means, then, that in the far-sighted eye muscular effort is always being made in focussing the light rays, and it follows that the nearer the object is to the eye the greater must be the effort made in forming a distinct image. The result is that far sight frequently produces

a much greater strain than does near sight. The consequences are often serious. Distant vision may be poor in some cases of hyperopia, so that the far-sighted person may think he is near-sighted. Convex lenses are required to neutralize the defect.

In astigmatism we have to do usually with a curvature deformity of the cornea. Theoretically, this should be a perfectly curved surface so that the pencil of rays would traverse the eye as a cone of light. The fact is, however, that such is rarely the case. In the great majority of eyes in civilized races the cornea is more or less distorted. It refracts the light unequally in different planes; hence, the image is indistinct. The blurring may be decreased by constriction of the pupil, but there is nevertheless some strain thrown upon the ocular mechanism, for it is known that, in spite of the fact that distinctness of vision may be perfect in many cases, the resultant symptoms may be very severe. I shall return to this point later. Now, depending upon the type of curvature defect, the astigmatism may be myopic, in which case rays, in a certain plane, will focus in front of the retina; or, they may focus behind the retina, producing a simple hyperopic variety. Furthermore, the astigmatism may be, and usually is, combined with near sight or far sight, produced as above described. The condition is then known as compound myopic or compound hyperopic astigmatism, as the case may be. Sometimes an eye is myopic in one plane and hyperopic in another, the two abnormal planes of curvature being at right angles to each other. This is known as mixt astigmatism. Finally, the two eyes may have quite different curvature defects, one being myopic and the other hyperopic, for example. In fact, they nearly always differ in the amount of curvature or in the plane in which the defect lies. This condition of unlike refraction, known as "anisometropia," adds much to the difficulty of securing binocular vision when a certain limit, differing in individual cases, is past. It is a very common defect and is one of the most potent causes of eyestrain.

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It is difficult to account for this asymmetry of the two eyes. It is believed by many that pressure of the eyelids upon the cornea is the main cause of its distortion. This pressure of the lid is increased in "squinting" the eyes to exclude excessive light, a fact in accord with the greater prevalence of astigmatism in the vertical plane than in the horizontal. An explanation of curvature defects in the horizontal and in oblique planes is not so apparent. In any case, astigmatism is treated by concave or convex cylindrical lenses.

We may now turn our attention to the frequency of various types of refractive errors and certain related conditions. Our statistics[2] show that the great majority of our students are hyperopic, and it is interesting to observe that a large per cent (40%) have never had their eyes examined. It is just among these students that one will find many serious cases. It is commonly believed that if vision is good the eyes must be all right, whereas, the fact is that some of our saddest cases are among those who have excellent vision. In such instances it is the constant strain, ever so slight, thrown upon delicate nervous and muscular mechanisms of the eye, with consequent disturbances of the nervous system, that brings about disastrous results. This point can not be emphasized too strongly. The occupation of the student is prone to overwork the eyes. Our statistics show this, for we find that among our regularly enrolled students at least 25 per cent have eyestrain and we have found the highest per cent of failing eyes among the students of the technical courses, such as mechanical engineering, where much close work is required. These young men tax their eyes much more than do those who come mainly from rural districts, for example, and whose work is largely out of doors. Amomg these men we find only 13 per cent of eyestrain cases, yet there are many with marked ocular defects. A number of these students from

[2] Among those not wearing glasses, 89 per cent were hyperopic. Ten per cent of these had visual acuity distinctly subnormal, often far below the standard. Of those wearing glasses, and hyperopic, 32 per cent had subnormal acuity.

the country develope eyestrain symptoms during their twelve weeks' course in the university. Another interesting thing is the greater per cent, 17 as against 8, of myopia. This suggests a few words about near sight and its treatment.

Myopia is such a common defect that people generally regard it as of little importance. It may or may not be a dangerous disease. It depends upon the type of myopia. Some oculists would say that it is always serious as it distinctly limits the field of vision. Certainly, in what is known as "progressive" myopia we have a very dangerous condition, for it may lead to total blindness; hence, it demands the most careful treatment. It is pitiful to see how some cases of myopia are handled, or even allowed to go untreated entirely. Many instances of such neglect of eyes could be given, as could also many examples of the bungling work done in attempting to clear up the eyesight of patients with this defect. So many times the astigmatism associated with the disease is not detected, or is disregarded, and simple concave lenses are given to improve the sight with the consequence that the myopia continues to increase.

Attention is called to the prevalence of unequal sharpness of sight in the two eyes. In this connection I wish to speak particularly of two important related conditions which result from abnormal refraction, namely, unilateral decline of visual acuity and anomalies of the external eye muscles. There can be no doubt that when curvature defects of the cornea reduce the sharpness of the image in one eye to a certain degree, which differs in different individuals, there is likely to be a concomitant decrease in the sensitiveness of the retina in that eye and also a tendency for it to "squint." Prof. C. von Hess, of Munich, has reccently reviewed and discust this matter lucidly and extensively in his work[3] on anomalies of refraction and accommodation in the human eye. In this work and in

[3] Chapter XII, in the *Graefe-Saemisch Handbuch der Gesamten Augenheilkunde*, 1910, p. 568.

American treatises there is abundant evidence that decreased visual acuity and squint, or strabismus, may result from the cause just mentioned. In our observations here we have been imprest with the number of cases in which vision has declined so gradually in one eye that the individual did not recognize the defect until the tests were made; and often, too, the sight has been found markedly reduced in both eyes without the patient being aware of it. We have never failed to detect an astigmatic defect in these cases, and more frequently it has been of the hyperopic variety. If the condition is limited to one eye, there may be no eyestrain. The explanation is that the more distinct image in the better eye gains the attention more easily than the less distinct image, which is disregarded. In other words, nature relinquishes the attempts to fuse the two dissimilar retinal impressions. This is one way by which the tragedies of eyestrain are avoided. It is the difficulty of securing good binocular vision that causes much of the suffering alluded to. However, it is a matter of serious importance that, in being spared this suffering which so many undergo, an eye in certain cases is not employed, for in this latter instance there comes a gradual loss of function from disuse.

The anomalies of the muscles that move the eyeballs are often ignorantly mistaken for the primary causes of eyestrain when in truth they may be secondary to the refractive errors. As already indicated, hyperopic defects require greater muscular, and hence nervous, effort than the normal and myopic eye, especially in near work; consequently, convergent and divergent squint are very common. Less frequently the muscles that elevate and depress the eyes are involved, but in such a case the symptoms are likely to be more severe. These muscular troubles are by no means confined to the far-sighted persons, but are often seen in myopes also. In young people especially these muscular defects are almost solely due to refractive errors, of which astigmatism is the most important factor. Crossing of the eyes may be regarded, in most instances, as an ex-

pression of over-use of the muscles concerned in adjusting the eyes to near work; the turning out of an eye means, generally, that it is becoming functionless because of some defect in refraction. It is obvious how important it is to distinguish between cause and effect in these cases. It often happens that with people who have had no eye-strain because of monocular vision, with or without associated squint, trouble first begins when some unskilled person tries to fit the non-used eye with a glass to improve the sight, or attempts to straighten a deviated eye by means of a prism or by surgical operation. The restoration of function to an organ long inactive requires careful scientific methods, and of the eye this is eminently true. Often the most accurate measurements of the defects do not give results at once satisfactory to the patient. There are many reasons for this that can not be entered into here.[4] Without in the least apologizing for the poor work done so often in refracting the eyes, a point to be taken up later, it can be said that many times failure to quickly secure relief for the eyestrain sufferer is not the fault of the oculist at all. It seems that in certain individuals the nervous system is temporarily much disturbed by the more or less sudden resumption of function in a retina that has been inactive for a time. Indeed, it seems that the mere process of interpreting accurately formed retinal images after a long period of adjustment to distorted ones is sufficient to make some patients very uncomfortable. At any rate, many a case has to be nursed along for weeks, with different lenses and with limitations of the use of the eyes, until the nerve centers and eyes reach a more stable condition. In strong contrast to this type of patient is the one who has slowly developed a marked refractive error in one or both eyes, so that distant vision is poor and near work can be done only with much strain to the ocular mechanism, yet no symptoms whatever are apparent. It is to be remembered, however, that when one eye is thrown out

[4] Read: "Sixty-eight reasons why glasses did not give relief," Gould, *American Medicine*, July 4, 1903; *Biographic Clinics*, Vol. II.

of function in the manner described it will eventually become useless unless restored to activity by a correct lens; and the longer the period of inactivity is extended, the more difficult will be the task of recovering the eye's function.[5] Students who are getting along with monocular vision usually appreciate the importance of this matter when it is properly placed before them.

I have several times referred to "symptoms" of eyestrain. What are they, it may be asked. In order that the difficulty in satisfactorily answering this question may be appreciated, some preliminary remarks upon the relation of the eye and the nervous system will be helpful.

The perplexing problem of the way in which visual stimuli become shunted off to different parts of the body thru the mediation of the nervous system has been studied extensively and we gain useful information from various fields. The embryological development of the sensitive elements of the retina from the forebrain has been worked out, and the paths of the optic nerves and certain of their connections with great brain centers demonstrated; psychologists and physiologists have revealed much of the interaction of the cerebral visual centers of the two eyes; the functional relation of the eyes to the process of equilibration by virtue of paths leading to the cerebellum, the great organ of coordination, has been established. Of special interest in connection with eyestrain are: (1) the demonstration[6] of the reinforcement of visual sensations by the activity of the intrinsic ocular muscles, the influence of which reinforces the cerebro-retinal tracts, and (2) the coordination of the extrinsic muscles in binocular vision and their intimate functional relation to accommodation. In addition, I may allude to the enormous number of nervous impulses that must flow to the brain from the eye in a given unit of time. Sherrington, the physiologist, has emphasized this point in his book[7] on the nervous system. In

[5] Hess, *Loc. cit.*, p. 569.

[6] McDougal, W., *Mind.*, 1903; Vol. 28, N. S. 12, p. 473.

[7] *Integrative action of the nervous system*, 1906, chaps. IX and X.

this connection he mentions an interesting fact; discussing the organization of neural function as influenced by the "receptive range" of certain sense organs, he states (p. 334) that the optic nerve in man contains more conductive channels than are present in all the ingoing spinal roots of one side of the body put together; by actual count, 1,000,000 as against 634,000. It is worthy to note, too, that four of the twelve pairs of cranial nerves are devoted exclusively to the function of vision, the eye being also in part supplied by the sympathetic system. From such consideration as these we can more easily understand what an important rôle vision plays in normal nervous processes; and the same observations make less difficult the comprehension of the results of abnormal ocular functioning. We can predicate that when the defects described earlier in this paper exist some such chain of events as the following may arise: refractive errors interfere with the focussing of light; primarily, there is an effort of the accommodation mechanism and iris to compensate for the imperfect focussing; this involves an abnormal amount of muscular action, which possibly reacts upon the cerebro-retinal tracts; hyperexcitability of certain nerve centers in control of these ocular functions is doubtless at first developed, with subsequent depletion of their energy; their condition in turn interferes to a degree with that of the centers governing other organs; at certain stages vascular, and hence nutritional, disturbances arise in the eye, with temporary and possibly permanent effects upon the retina and focussing structures; there is thus established a series of abnormal actions.

Symptoms of eyestrain manifest themselves in many ways, and in one case they may in no wise resemble those of another, altho the defects in the two instances may be very similar. These variations are to be traced to deep-seated differences in the nervous organizations of people. The complex connections of the nerve centers involved in the elaboration of stimuli from the retina are only poorly understood, but it is certain that abnormal activities may

be started in these centers, in many persons, as a result of impulses coming from eyes damaged by refractive errors. The condition may develop into a real mental trouble, of one type or another, or some distant organ may be the one effected. In either case there may be no local sign about the eyes that would suggest to the sufferer that the cause is an ocular abnormality. Frequently, however, the eyes give the first indication by redness, smarting or burning, itching of the lids, and blurring of sight; there may be sensitiveness of the eyes to light, profuse secretion of tears, pain or aching about the eyes, or a sense or drowsiness when attempting to do near work. These are easily appreciated by the sufferer and their cause suspected, but the other class of symptoms reflexly developed in the digestive system particularly, and in the nervous system, are of the greatest importance, as failure to recognize them may result in serious consequences. They are mistaken for real disease in the organs mentioned and all sorts of remedies are resorted to, when the only thing needed is a pair of scientific spectacles properly worn. It would be interesting to know how many so-called dyspeptics and neurasthenics there are who need simply a pair of glasses instead of elaborate and expensive sanitorium treatment. However, we do not find many such cases among students. The common symptoms among our young men are those already mentioned as local signs about the eyes, drowsiness on attempting to study, and occasionally headaches. Sometimes a case of insomnia is met with and nervous breakdown is now and then seen as the direct result of eyestrain. Of all of these symptoms insomnia is the most distressing, and I know of no greater mental torment than that suffered by the person who can not sleep. That insomnia often has a tragic termination is fairly well known, but that eyestrain is a frequent cause of the insomnia is much less generally recognized. If this truth were appreciated there would be less mystery about many strange and illogical cases of suicide. And, let it be remembered, refractive errors *of low degree* may be the cause of all these results.

Digestive disturbances ranging from mild or severe dyspepsia to symptoms simulating those of appendicitis[8] may be observed, but among students these symptoms are often to be traced to poor food and bad habits. Nevertheless, indigestion, "biliousness," and constipation are not infrequently found to result from eyestrain. It is to be pointed out that all of these symptoms may be temporarily relieved by exercise, so that this accounts for the fact that our male students may have really serious ocular defects and yet get on without glasses. With the student exercise is usually one of his main interests, for the spirit of play is in him, but in other walks of life we find busy people driven by mysterious ill health to outdoor activities, which take many precious hours needed for writing. We owe an interesting observation to Dr. G. M. Gould, who, in an extensive study[9] of the lives of celebrated people, musicians and various classes of eye workers, has adduced ample evidence that often an inordinate amount of exercise is indulged in, usually at night, for the relief of distress, mainly in the head or stomach. (Witness the cases of Huxley, Swift, Parkman and Wagner, and De Quincy in his lonely walks, day and night, rain or shine, round and round a circle for ten or fifteen or more miles a day; and again, Carlyle, who said that he had ridden one horse 20,000 miles.) It is suggestive, to say the least, that in every case the relief obtained vanished almost as soon as eye work was resumed. When taken along with other signs, excessive exercise is certainly excellent evidence of eyestrain in certain types of patients. To digress a little further, it is a matter of great interest that, as Gould[10] has pointed out, many of the great literary geniuses of the nineteenth century were probably sufferers from malfunctioning eyes. Whether we quite agree with him or not in his inference as to their pessimistic views, there can be no doubt that the outlook on life that such sufferers have is most gloomy.

[8] Morris, Dr. Robert T., *Medical Record*, Dec. 26, 1903.

[9] Gould, G. M., *Biographic Clinics*, 1903–1909.

[10] Gould, *Ibid.*, III, p. 72.

Among women, headaches, especially sick headaches, are the common complaint. To be sure, headaches have various and many causes, but undoubtedly astigmatism is the most common. Dr. de Schweinitz in his work[11] on the eye states that at least 60 per cent of functional headaches have this origin. Gould places the figure higher. Astigmatism is very likely to aggravate a tendency to headaches or to produce reflex pain in various organs. Girls become anemic and poorly nourished from reflex disturbances of this sort, and thus functional disorders pave the way for more serious and real disease of various organs. Many young women develop the condition vaguely indicated by the term "neurasthenia," a word much misunderstood by both physicians and laymen. Every experienced oculist has seen cases in which these different symptoms, apparently peculiar to women, quickly disappeared under treatment with glasses.

Another significant symptom frequently met with among young people is slow adjustment of the eyes when the focus is changed, especially from near to far objects. Nature has developed a marvelous mechanism for this act of accommodation. In eyes that are normal this process occurs almost instantly in young people but in tired, overworked eyes a considerable time, easily appreciated, will elapse before the adjustment is completed. This usually means that the eyes are working under the strain of a hyperopic defect, of which astigmatism is the most important factor. This should be corrected by accurate glasses as early as possible, and certainly as soon as symptoms are recognized.

There are many other evidences of ocular strain, but I shall mention only some of the more frequent of them, all of which have been found amongst our own records; they are: styes, spasm of the eyelids, dizziness, fading vision, squinting, blind spells, choroiditis, retinitis, confusion of mind, melancholia, pain in the back of the neck or shoulders, and lateral curvature of the spine (shown by Dr. Gould to be produced by head tilting as the result of the

[11] *Diseases of the Eye*, 1910.

usual writing posture and of astigmatism). Undoubtedly many people tilt the head unconsciously because it sharpens the vision somewhat by rendering lines in certain planes more distinct. Thus, astigmatism may produce in the course of time a deformity of the spine and this deformity in the shape of lateral curvature may, in turn, be a source of muscular strain. We find a large per cent of the students to have lateral spinal curvature. In some, it is certainly a condition of importance.

Much more could be said upon the subject of symptoms. It is true that many of those mentioned are not always due to eyestrain; nevertheless, when observed, they arouse the suspicion of defective eyes. The question that next presents itself is how these symptoms may be relieved.

This is indeed a problem, because it is so difficult to find skilled refractionists. There are many specialists so called, but there are comparatively few men who have the requisite medical and scientific training and the necessary skill, I might say art, combined to make good eye specialists. Such men need to be physicians in the true sense, men with learning, judgment, and sympathy. But what are the conditions in this country with respect to refraction work? They are deplorable, and mainly for two reasons: First, the neglect of the medical profession to establish schools where refraction is properly taught and where the importance of refractive errors is emphasized and demonstrated; secondly, lax laws permitting all sorts of people to do refraction work and sell spectacles. Unfortunate and vicious legislative enactments bearing upon this subject have been made in this country with the result that we have conditions that are astonishing when we remember the pride we take in our twentieth century educational methods. This is the situation: Our laws have made it possible for people to do refraction work without having any knowledge of the eye and its diseases, and particularly without the slightest idea of the close relation of ocular conditions to pathological states of other organs, and thus it comes about that many persons, ignorant of

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the complexity of the eye, and of the skill and knowledge required to treat its diseases, so often due to refractive errors, place themselves in the hands of "eyesight specialists" and persons who make a great point about testing the eyes without the use of drugs or "poison drops;" the result is that miserable refraction work is done and serious lesions of the eye are overlookt. Not infrequently ocular disturbances are due to disease processes that primarily have a very different source, as in diabetes and Bright's disease. From ignorance of this point, the diagnosis of dangerous maladies is delayed. Itis an astonishing fact[12] that twenty-six states in this country encourage work to be done in this way by licensing people to practise optometry without a medical education and with no more experience than a few weeks' or months' training in elementary optics. And what is more to our shame, we are not yet rid of quacks who don't refract but who prey upon ignorant people by offering to cure for stated sums all sorts of serious ocular diseases by magic eye treatment of one kind or another.

Aside from the miserable practises of the out-and-out quacks, who prey upon the ignorant public, there is a fearful amount of botch work done, both in the examination of eyes and the adjustment of glasses, so that there is almost as much *glass strain* as eyestrain. The main reasons for this unsatisfactory state of affairs are these: We find refraction being done without cycloplegia, or drops, in cases in which such a procedure is absolutely essential for determining all the facts required. Patients are not required to return for confirmatory examinations and inspection of their glasses. They are not told the importance of keeping their glasses properly adjusted and cleaned. Their eyelashes are allowed to rub against the lenses, and foolish notions about spectacles are permitted to interfere with the oculist's work. The most astonishing thing is the employment by oculists of incorrect test lenses,

[12] Jackson, Dr. Edward: "The optometry question and the larger issue behind it." *Journ. American Medical Association*, 1911, LVII, p. 265.

of which there must be an amazing number in the land, because it has been found that even the best optical firms have put out test cases, pronounced perfect, which in some instances have proved to contain many wrongly marked lenses, particularly among the cylinders. One such "perfect" set contained nearly 17 per cent of incorrect cylinders.[13] In addition, the opticians who grind the lenses for the patient frequently do miserable work (one physician[13] estimates that about fifty per cent of oculists' prescriptions are not accurately filled). They interchange the lenses, or reverse them, center them improperly, locate the axes wrongly, and adjust the frames badly. It is no wonder that people often fail to obtain relief, become discouraged, and eventually resort to almost anything in their despair. It is evident that in this branch of medicine there is a serious state of affairs, which has existed entirely too long and which calls for intelligent legislative regulation of the practise of ophthalmology.

In the preceding paragraphs I have spoken frequently of eyestrain. From what has been said it may be seen that, as a rule, this strain is produced by abnormal conditions of the eye and not by abuse of normal eyes, tho it is quite possible to maltreat good eyes by excessive and close work. The fact is that perfect eyes, optically speaking, do not exist. The defects in some eyes are so slight that they are negligible, but in over 90 per cent of our college students visual work is done under the handicap of refractive errors, which can be easily demonstrated. On the average, 35 per cent of these students suffer to some degree from these ocular defects, and in some of our colleges 50 to 60 per cent of the students need glasses. In one of our government institutions nearly every person enrolled wears glasses by the time he graduates. These facts show the important relation ocular defects bear to education. This matter has occupied for some years the attention of those in control of the public schools and

[13]Hartshorne, Isaac: "Accurate optics." *Boston Medical and Surgical Journal*, CLXIV, 1911, p. 786.

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much has been done to improve conditions in this respect. Of recent work that of Dr. Wm. Martin Richards in the New York public schools is the most striking in its results. Dr. Richards selected thirty-eight pupils from the lower grades in schools 4 and 44, Bronx, New York, and made careful tests of the eyes, prescribed proper glasses, and saw that they were worn. Thirty-two pupils were hyperopic, two were myopic, and three had mixt defects of both eyes. He found that small errors, of the amount usually neglected, were one of the causes of failure to progress in the school work. From the reports of the teachers supervising the work of these pupils under observation one gathers the most astonishing facts. They can not be given here in detail. It is sufficient to state that the most marked psychic and mental improvement occurred in many of the cases, and in some it amounted to a complete change in the character of the child, formerly dull or unmanageable.

This is an indication of what can be done. The campaign of education in this direction has not been extended sufficiently and in our institutions of higher learning much needs to be accomplished if we are to make a consistent attempt to guard the health of the students.[14] The intimate connection which exists between the eyes and other organs can not be unduly emphasized. It is certain that many good students have failed, either in college or later, because of the excessive drain upon the nervous energy which followed from the use of eyes deformed by the common defects described. What a lamentable thing is a life wrecked by eyestrain when a pair of scientific spectacles would have prevented the disaster! To those who have not the opportunity to witness the unfortunate and distressing cases that present themselves to the physician for relief from ocular disease

[14] From inquiries sent out to 150 colleges and universities, I have found that there are several, including some of great prominence, in which no eye examinations are made. In most places the tests are very superficial and of little value.

and to those who have never thus personally suffered, it seems that to speak of eyestrain "wrecking" lives is but using the words of the sensation monger and hobby-rider. Let no one be deceived by the belief that we are dealing here merely with a subject that only the specialist considers all-important; rather let us accept the facts as they actually are. That the visual apparatus is not meeting successfully the demands made upon it by civilization is an old truth. It should be appreciated that, with the exception of a few out-of-door pursuits as agriculture, for example, nearly every kind of activity which our educational courses prepare students to enter requires hours of continuous, close application daily. Even the agriculturist must do more and more reading as time goes on, and he must take a college course, and use his eyes for close work to a much greater degree than heretofore. There is scarcely any vocation that does not tax the eyes to the limit[15]; they have enough to do under the best of circumstances. The added burden entailed by refractive errors means that in any case it is only a matter of time till something gives way. Those who are afflicted with ills induced by refractive errors should have the opportunity of having these defects neutralized by scientific spectacles. There is a great field in this division of medicine for the relief of suffering humanity, and for carefully trained physicians there is the opportunity, in thousands of localities, for doing an inestimable service.

M. Dresbach, M.D.

Cornell University
Ithaca, N. Y.

[15] Read the address, *Eyestrain and occupational disease*, delivered by Dr. Gould, at the Fifteenth International Congress on Hygiene and Demography, Washington, D. C., Sept. 23–28, 1912. Reprinted in the report of the meeting, and in the *Medical Review of Reviews*, Nov., 1912.

VII

DISCUSSIONS

THE ACCEPTANCE OF AMERICAN COLLEGE DEGREES BY FOREIGN UNIVERSITIES[1]

To the Association of American Universities: At the sixth annual Conference of the Association of American Universities held with the Johns Hopkins University, in January, 1905, a communication from the Faculty of Philosophy of the University of Berlin was reported by the secretary, and subsequently incorporated in the Proceedings of the Association, to the following effect:

"The Faculty recognizes every Bachelor's degree (A.B., B.S., etc.) acquired at an American university, as the equivalent of the German *Maturitätszeugnis*. Toward the prescribed triennium the Faculty will reckon, on the recommendation of the requisite ministerial permit, in the rule only those years of study in America which are spent after the acquisition of the Bachelor's degree at one of the universities belonging to the Association of American Universities. The candidate must, nevertheless, have studied at least three semesters at a German university."

No action upon the communication was taken by the Conference, which simply accepted it for inclusion in the proceedings.

The construction placed by the University of Berlin upon this enactment, which seems to state that a bachelor's degree acquired at any American university will be accepted as the equivalent of the *Maturitätszeugnis*, has been in actual practise to restrict its provisions thruout to the institutions included in the Association of American Universities, and only the degrees bestowed by its members have been accepted as fulfilling the conditions of matriculation. This action, originally taken by the University of Berlin, was presently extended to the other Prussian univer-

[1] At the annual Conference of the Association of American Universities, held on November 6–8 with the University of Illinois, the following report of the Executive Committee of the Association was unanimously approved and the resolution of recommendation was adopted.

sities and ultimately has become the policy generally of the universities of Germany, and incidentally of those of Holland, with regard to the matriculation of American students.

The institutions of recognized college rank in the United States that by reason of their non-inclusion in the membership of the Association of American Universities were made ineligible under this action of the German universities in the acceptance of their bachelor's degrees have complained from the beginning at what they have considered an unjustifiable discrimination against them. It has been pointed out by many of them that their college courses are on a full basis of equivalency with those of the institutions of university rank included in the membership of the Association, and that their bachelor's degrees are so recognized in that they are accepted without question by the universities belonging to the Association as entitling their holders to matriculate as candidates for higher degrees.

This attitude toward the bachelor's degrees of colleges which are on a demonstrable basis of equality with the colleges of the members of this Association, has been further accentuated by the more recent action again taken by the Faculty of Philosophy of the University of Berlin, which was communicated to the Association at the last Conference and is included in the proceedings of that Conference. This action, after repeating the previous enactment, already quoted, is to add after the last sentence the following:

"If, however, the period of study prior to the attainment of the bachelor's degree has covered four years, the faculty will ordinarily recommend the credit of one of these years toward the triennium."

This last is, of course, a very material concession to the graduates of those American colleges to which recognition has been accorded, since it shortens by a whole year the normal period of study in a German university of candidates for the Doctor of Philosophy degree.

The reasons underlying the selection of the degrees given by members of the Association of American Universities as alone entitled to the right of matriculation are not diffi-

cult to discern. Up to the time of the organization of the Association of American Universities there had been no body of institutions in the United States that could justly be assumed to possess such a condition of educational responsibility as was desired by the German authorities for a proper evaluation of the degrees of American colleges submitted to them by students who had presented themselves for matriculation. The Association commended itself to them by the reality of its purposes and efforts as indicated by its publisht proceedings, and the official recognition of the educational status of this group of institutions ultimately followed. In doing this there could have been, of course, on the part of the German authorities no possible thought of any other discrimination than was involved in the acceptance of what was known instead of what was unknown, and the real discrimination that was made lay, in fact, at the door of the Association of American Universities because of the constitution of its membership. For the Association, however, be it said that this result of the acceptance by foreign universities of the bachelor's degrees of its members and of no others had never been intended or foreseen. It had simply resulted from the fact of the peculiar constitution of the American university which has normally as a part of its organization the undergraduate college as well as the graduate schools.

The matter of the non-recognition of the bachelor's degrees of American colleges outside of the membership of the Association of American Universities has already been brought to the attention of the Association. At the ninth annual Conference, held with the University of Michigan, in 1908, a detailed report on The Aim and Scope of the Association was submitted by a special committee under the chairmanship of President Eliot, of Harvard, which had been constituted at the preceding meeting with instructions to consider these questions in all their bearings.

A part of this report bearing upon the present matter, as it is included in the proceedings of the ninth annual Conference, is as follows:

"Your committee strongly believes that it is the duty of this Association to admit outstanding American universities as soon as they satisfy the criteria which have been laid down by the committee. Foreign governments, more particularly the Prussian and Dutch, now recognize the universities which are members of this Association and refuse recognition of those which are not. It is the duty of this Association either to standardize American universities, and thus justify the confidence which foreign governments repose in them, or to notify those governments that there are American universities outside this Association whose work and standing are not inferior to universities now members of the Association.

"So far your committee has spoken only of the *universities* of the country. But our *colleges* are also suffering from the interpretation which foreign governments have put upon the existence and work of this Association. The best of them even find that their degrees are not recognized by foreign governments, even to the extent of permitting them to matriculate in foreign universities, on the ground that they are not members of the Association of American Universities. In the opinion of your committee the simplest way of correcting that injustice would be for this Association to make a list of the colleges of the country whose degrees it regards as of equal value with the college degrees conferred by the universities embraced in this Association. It happens, however, that another organization, for a purely financial reason, has been compelled to standardize a group of American colleges. That institution is the Carnegie Foundation for the Advancement of Teaching. The presidents of a number of institutions represented in this Association are members of the Board of Trustees of the Carnegie Foundation and the president of that foundation has seat and voice in this Association. The Carnegie Foundation has collected an enormous amount of valuable statistics and information regarding colleges, which it gladly puts at the disposal of other educational associations and agencies. It would seem very desirable, therefore, that the aid of this organization should be secured, if this Association is to undertake the standardizing of American colleges. And that it ought to undertake that task is the conviction of your committee, especially as the injustice done our American colleges by foreign governments is due to the existence and operations of this Association. And a further and still more convincing reason will exist for this Association's undertaking the work of standardizing American colleges if, as your committee has recommended, universities hereafter admitted to this Association shall rest their professional work on *college* work; for this Association as a body and the different universities which compose it would then all have before them the problem of determining what colleges in the country give instruction in arts and science which may be regarded as an equivalent of that given by the universities themselves.

"Your committee accordingly recommends that the Association appoint a committee for the standardizing of American colleges, giving it instructions to secure the cooperation of the president of the Carnegie Foundation, who, in the name of the Association, should be officially invited to join in this undertaking."

In accordance with the recommendations of the report,

a special committee was appointed to consider the whole matter involved in the report. The committee thus constituted subsequently functioned as a Committee on Membership in the Association, but the matter of the evaluation of college degrees, contemplated by the report, was never undertaken.

The matter, however, was again taken up by the last Conference of the Association, in connection with the report to the Conference of the action of the Faculty of Philosophy of the University of Berlin, already cited, when the following resolution was adopted:

Resolved, that the Executive Committee be requested to consider seriously the bearing of this enactment upon other institutions, as well as upon those already members of this Association.

In accordance with this request, this report and recommendation is respectfully submitted for such ultimate action as the Association may desire to take in the premises.

The making of a list of the colleges of the country whose degrees are regarded by the Association as of equal value with the college degrees conferred by the universities embraced in its membership, as suggested by the special committee on Aim and Scope, is not the simple task thatt he report supposes. It would plainly be impossible with any machinery that is now at hand for the Association itself to make such a list, which would involve not only an immense amount of correspondence, but also a great deal of personal scrutiny as to actual conditions. The Association, too, should not be called upon to bear the onus of a classification that would almost inevitably awaken opposition on the part of disqualified colleges and active animosity on the part of some of them. Such a list could only properly be made under the circumstances at hand by a body outside the membership of the Association. The Carnegie Foundation for the Advancement of Teaching could properly make such a list, and more properly the United States Bureau of Education could complete the list that it has already begun.

In the absence, however, of such a list, and the immediate

prospect of one, the Executive Committee would make the following suggestions and recommendations:

To be included in a list of American institutions whose bachelor's degrees should be accepted by foreign universities are:

First, the members present and future of the Association of American Universities.

Secondly, those other institutions on the accepted list of the Carnegie Foundation for the Advancement of Teaching, about whose claims to recognitions there can be no question.

Thirdly, those institutions which are not included in the accepted list of the Carnegie Foundation because they are in some sense sectarian as defined in the terms of gift of the Fund, but otherwise conform to its standards of acceptability. Such a list has readily been furnished by the Carnegie Foundation with the understanding that it is to be used for the present purpose.

The list thus constituted consists, with the inclusion of the 22 members of the Association, of 118 colleges and universities as here appended. It includes both endowed and tax-supported institutions. It includes, furthermore, no institution which does not require for admission a full four-year high school course, nor does it include any institution not supported by taxation which has a productive endowment of less than $200,000, or any tax-supported institution whose annual income is less than $100,000, as provided by the rules for the admission of institutions to the privileges of the Carnegie Foundation. The standard thus set up and applied by the Carnegie Foundation is believed to be a real one, as is affirmed by the presence on the governing board of the Foundation at the present time of eight of the presidents of the universities that constitute the membership of this Association. The list of colleges and universities submitted is not relatively a large one, and it may very well be that there are other institutions omitted from the list, that in many respects deserve to be ranked with them. It would seem best, however, to take

a conservative attitude and to include in a preliminary recommendation only those colleges and universities whose standards of accomplishment are unquestionably recognized by the Association as fulfilling the conditions of matriculation and are rightly entitled to share with the members of the Association in such privilege. It is much easier to enlarge a list than to diminish it, and a further recommendation can readily be made by this Association, if circumstances shall seem to warrant it.

The following resolution is accordingly submitted to the Association with the request for its adoption:

Resolved, that this Association recommend to the Prussian *Kultusministerium* and the corresponding ministries of the other German states that, for the present, there be recognized as the equivalent of the German *Maturitätszeugnis*, not only the bachelors' degrees conferred by the members of this Association, but also the degrees of those other American colleges and universities which are on the accepted list of the Carnegie Foundation or which are certified by this Foundation as of equivalent standing but excluded from its accepted list for other than educational reasons. For the information of the authorities concerned, a list of these colleges and universities is here appended:

Allegheny College	Meadville, Pa.
Amherst College	Amherst, Mass.
Bates College	Lewiston, Me.
Beloit College	Beloit, Wisconsin
Boston University	Boston, Mass.
Bowdoin College	Brunswick, Me.
Brooklyn Polytechnic Institute	Brooklyn, N. Y.
Brown University	Providence, R. I.
Bryn Mawr College	Bryn Mawr, Pa.
Carleton College	Northfield, Minn.
Case School of Applied Science	Cleveland, Ohio.
*Catholic University of America	Washington, D. C.
Central University of Kentucky	Danville, Ky.
Clark College	Worcester, Mass.
Clarkson School of Technology	Potsdam, N. Y.
*Clark University	Worcester, Mass.
Coe College	Cedar Rapids, Iowa
Colby College	Waterville, Me.
Colgate University	Hamilton, N. Y.

Colorado College	Colorado Springs, Colo.
*Columbia University	New York, N. Y.
Cornell College	Mt. Vernon, Iowa
*Cornell University	Ithaca, N. Y.
Dartmouth College	Hanover, N. H.
DePauw University	Greencastle, Ind.
Dickinson College	Carlisle, Pa.
Drake University	Des Moines, Iowa
Drury College	Springfield, Mo.
Earlham College	Richmond, Ind.
Elmira College	Elmira, N. Y.
Fordham University	Fordham, N. Y.
Franklin College	Franklin, Ind.
Goucher College	Baltimore, Md.
Grinnell College	Grinnell, Iowa
Hamilton College	Clinton, N. Y.
*Harvard University	Cambridge, Mass.
Haverford College	Haverford, Pa.
Hobart College	Geneva, N. Y.
*Indiana University	Bloomington, Ind.
Iowa State College	Ames, Iowa
*Johns Hopkins University	Baltimore, Md.
Kenyon College	Gambier, Ohio
Knox College	Galesburg, Ill.
Lafayette College	Easton, Pa.
Lake Forest College	Lake Forest, Ill.
Lawrence College	Appleton, Wisconsin
Lehigh University	South Bethlehem, Pa.
*Leland Stanford Jr. University	Stanford University, Cal.
Marietta College	Marietta, Ohio
Massachusetts Institute of Tech	Boston, Mass.
Miami University	Oxford, Ohio
Middlebury College	Middlebury, Vt.
Mount Holyoke College	South Hadley, Mass.
New York University	New York City
Northwestern University	Evanston, Ill.
Oberlin College	Oberlin, Ohio
Ohio State University	Columbus, Ohio
Ohio Wesleyan University	Delaware, Ohio
Pennsylvania State College	State College, Pa.
Pomona College	Claremont, Cal.
*Princeton University	Princeton, N. J.
Purdue University	Lafayette, Ind.
Radcliffe College	Cambridge, Mass.
Reed College	Portland, Oregon
Rensselaer Polytechnic Institute	Troy, N. Y.
Ripon College	Ripon, Wisconsin
Rose Polytechnic Institute	Terre Haute, Ind.
Rutgers College	New Brunswick, N. J.
Smith College	Northampton, Mass.

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State College of Washington	Pullman, Wash.
*State University of Iowa	Iowa City, Iowa
Stevens Institute of Technology	Hoboken, N. J.
Swarthmore College	Swarthmore, Pa.
Syracuse University	Syracuse, N. Y.
Trinity College	Durham, N. C.
Trinity College	Hartford, Conn.
Tufts College	Medford, Mass.
Tulane University	New Orleans, La.
Union University	Schenectady, N. Y.
*University of California	Berkeley, California
*University of Chicago	Chicago, Ill.
University of Cincinnati	Cincinnati, Ohio
University of Colorado	Boulder, Colo.
University of Georgia	Athens, Ga.
*University of Illinois	Urbana, Ill.
*University of Kansas	Lawrence, Kansas
University of Maine	Orono, Me.
*University of Michigan	Ann Arbor, Mich.
*University of Minnesota	Minneapolis, Minn.
*University of Missouri	Columbia, Mo.
*University of Nebraska	Lincoln, Neb.
University of North Carolina	Chapel Hill, N. C.
University of Oregon	Eugene, Oregon
*University of Pennsylvania	Philadelphia, Pa.
University of Pittsburgh	Pittsburgh, Pa.
University of Rochester	Rochester, N. Y.
University of South Dakota	Vermillion, S. D.
University of the South	Sewanee, Tenn.
University of Tennessee	Knoxville, Tenn.
University of Texas	Austin, Texas
University of Vermont	Burlington, Vt.
*University of Virginia	Charlottesville, Va.
University of Washington	Seattle, Wash.
*University of Wisconsin	Madison, Wisconsin
University of Wooster	Wooster, Ohio
Vanderbilt University	Nashville, Tenn.
Vassar College	Poughkeepsie, N. Y.
Wabash College	Crawfordsville, Ind.
Washington & Jefferson College	Washington, Pa.
Washington University	St. Louis, Mo.
Wellesley College	Wellesley, Mass.
Wells College	Aurora, N. Y.
Wesleyan University	Middletown, Conn.
Western Reserve University	Cleveland, Ohio
William Jewell College	Liberty, Mo.
Williams College	Williamstown, Mass.
Worcester Polytechnic Institute	Worcester, Mass.
*Yale University	New Haven, Conn.

* Institutions starred are members of the Association of American Universities.

VIII

REVIEWS

The world we live in, or philosophy and life in the light of modern thought—By GEORGE STUART FULLERTON. New York: The Macmillan Company, 1912. xii + 293 p.

The subject matter of Professor Fullerton's book is a defense of our common sense, or every-day realism, against the tenets of all idealists from Descartes to Professor Royce. The book is popular, evidently intended for the general reader and not merely for the college student and his teacher. "But why," you inquire, "should the cultured public be asked to attend to the issue between idealism and realism, an issue seemingly of purely technical philosophical interest?" As I see it, there are two major reasons: First, idealists are numerous; indeed few of us are entirely free from idealistic beliefs. Second, idealism illustrates a dangerous trait of our times, a certain soft-headedness. As to the first reason: students have been taught idealism of one kind or another in almost every protestant college and university for over a century, until the doctrine's chief premises have come to seem axiomatic and to be accepted even by those thinkers who pride themselves most upon their emancipation from all metaphysical speculation and from interest in such vain pursuits. Now, after two hundred years, the time is ripe for a reaction against this complacent philosophy, and the reaction has begun. The insurgent movement is called New Realism. Its first undertaking is, of course, purely missionary or more precisely, habit breaking, and this is a gigantic undertaking. Thoughtful men, and in fact all men of culture must be broken of every idealistic habit of thought, for there is not one of us, not even you, the reader, who has not been taught these habits from youth.

The chief idealistic habit of thought is this: The con-

tent of our thought, perception, and feeling is always mental, and is always of our manufacture. As a result, our outlook upon every problem is psychological and our world and our theory of life are psycho-centric. For example, there is nothing real but thinking makes it so, there is nothing true but thinking makes it so, there is nothing good but thinking makes it so, there is nothing valuable but again thinking makes it so. Nowhere have we a grip upon a genuinely objective order of reality or of life. We evolve and transform our world as we proceed, be that world political, social, economic, moral or physical. In a sentence, we make the world, the world does not make us. Now, this doctrine is wide-spread, subtle and false.

I have been told that Carlyle exclaimed, when told of a philosophical youth who had made the statement, "I am beginning to believe that the world of sense-perception is real," "Gad, he'd better!" This comment of Carlyle indicates the second reason why the cultured man should be interested in this philosophical issue. Idealism encourages the use of a dangerous method. In the language of finance, idealism employs a get-rich-quick method. It increases wealth by printing paper dollars, or adds to capital by watering stock. In the language of medicine it is a narcotic and not a food. Finally, in the language of morals, it is a building of air castles and not hard work. Only one method has ever revealed to man the truth about things and the correct way in which to manage his affairs, to wit, observation of facts and experimental inquiry. This method is slow and prosaic, and often its results conflict with fondest hopes. But what miracles it has wrought and how it has ennobled human life! Idealism in the spirit of the time offers man an easier method. The ultimate nature of the world, the ultimate goal of life, God's existence, man's true place in the universe, and the solution of other difficult problems are yours to know by a little thinking, especially if you are initiated into the elementary doctrines of psychology. Thus the perplexed theologian,

the philosophical seer, and the social and moral Utopian are offered a method to prove quickly whatever each desires. Even the skeptic, the pessimist and the egotist can be provided with the intellectual tools each requires. In brief, there has always been offered to every man, even to the simplest and most ignorant, a choice of two philosophies, the soft-headed and the hard-headed. Hence we need in every department of life, political, social, economic, moral, religious, and scientific, to be taught from our childhood to avoid the hysteria and dreams of the former and to build slowly and patiently upon the rock of hard facts and demonstrated truth upon which the latter philosophy so irritatingly insists. To make your world or to play with the world is romantic, but how dull it is to be disciplined eternally by the hard commonplace world of everyday life. Now in our day the new realism preaches this hard-headed philosophy. Methinks, it makes the teacher of philosophy ask: should the day come in which the battle of realism against idealism has been won and in which realism will therefore have to confine itself quite to constructive research, will courses in philosophy be as well attended in our colleges as during the more romantic and exciting days of idealism? for realism's sober, solid information will require a keener intellectual interest on the part of the student than have the startling, highly dramatic messages of the various idealisms.

Such is the message in its essence to which Professor Fullerton's book is devoted. The book is, as was aforesaid, popular, not technical. Its style is playful, pungent, and altogether delightful. Its subject matter is timely, its purpose is serious, and its argument is sound. If you wish to see the issue between idealism and realism in its present philosophical status, read this book.

WALTER T. MARVIN

RUTGERS COLLEGE
NEW BRUNSWICK, N. J.

The art of education—By IRA WOODS HOWERTH. New York: The Macmillan Company. 1913. 237 p. $1.00.

The author has brought together in this volume many helpful and sensible suggestions regarding the nature of education and the various factors which are employed in its processes. There is a certain simplicity and freshness of treatment, which will commend the book to those who really wish to be enlightened.

It appears doubtful if the author has chosen the best title for his book. Education has become so highly differentiated and includes such a congeries of forces that there is a growing opinion that the word ART, as a generic term, is not applicable. It is generally conceded that *teaching* is an art and the whole force of teacher training is directed to the task of making him an artist. The person who now undertakes to grasp and control all the forces and processes of education is an administrator rather than an artist. He is dealing with a multiplicity of arts in the field of manual and vocational education alone. There are many lines of technical work, each calling for a specialist and each capable of almost infinite development.

The classification of arts into physical, vital, and social is ingenious and convenient but would be unsatisfactory to many. All workers in the field of literature, painting, sculpture, music, oratory, and the drama will think that they find no adequate recognition of their arts in the above-named category. To classify painting and sculpture with the mechanical trades does violence to all known theories of the higher life and the higher culture of the human soul.

The author's treatment of the Doctrine of Interest in several well-arranged chapters is perhaps the most valuable portion of the work. Its value lies not so much in its originality as in its being so presented as to furnish to parents and teachers many suggestive lines of departure. This is particularly true of the chapter devoted to Methods of Arousing Interest, in which there is a thoroly lucid sketch of the results of such observations as have been made by Barnes, Binet, Preyer, Shaw and others.

Another chapter devoted to the Finished Product is of equal importance for it suggests that too much attention has been given to the processes and too little to the results. The best insights will be obtained by teachers, in reviewing their work, by inquiring whether those whom they have taught actually possess health, intelligence, industry, public spirit, etc., and the administrator will examine conditions in the community to see if the school system over which he presides is duly affecting the homes, occupations, social life and political standards of the people.

While little consideration is given to the details of the process of teaching there are some excellent concrete instances to illustrate the principles underlying those processes. Among the excellent qualities of the book are its freedom from dogmatism, and the high deference which is paid to the opinions of other students of education.

SAMUEL T. DUTTON

TEACHERS COLLEGE
COLUMBIA UNIVERSITY

L'Année pédagogique—PUBLIÉE PAR L. CELLÉRIER ET L. DUGAS. Bibliothèque de philosophie contemporaine. Première année 1911. Paris, Félix Alcan. viii + 487 p. F 7.50.

This series, as its title suggests, aims to supply the need for a real educational annual, to economize the time and effort of the student of all phases of education by collecting the results of the most important contributions to educational thought, and thus to present bibliographically the progress of the year. The editors furthermore propose to include various articles of general educational interest.

The initial volume contains five special articles, three by the editors themselves, one by M. Emile Boutroux, and one by an anonymous contributor. Monsieur Boutroux, a warm admirer of the late Professor James, and a famous French savant, presents a sane discussion of a problem of present educational interest, "L'école et la vie." This and the anonymous article, "L'enseignement primaire," are especially noteworthy. The latter discusses with some frankness the present situation of primary education in

France, calling attention to the apparently increasing failure to enforce the compulsory education law that is such a frequent cause of complaint at the moment, altho his statement that "this law remains today a dead letter" is probably somewhat of an exaggeration. Enforcement of this law, reduction of the program of study, and elimination of politics from school affairs are three reforms that this writer believes to be most imperative.

The bibliographical portion of the book, comprizing more than four-fifths of the whole, is of most general interest, for it is an ambitious and highly commendable attempt to serve as the basis of a progressive study of comparative education. The important pedagogical books publisht in France, Germany, England and America during 1911 are here noted, together with an extended list of articles, classified by subject matter, and usually accompanied by more or less critical comment, culled from a hundred current magazines. As might be expected, Germany heads the list with fifty-three magazines, followed by France with eighteen, the United States with seventeen, England with nine, Austria with two, and Belgium with one. In all, more than twenty-five hundred titles are cataloged. Unfortunately, the most important French educational journal, *La revue internationale de l'enseignement*, and one of the most prominent American publications, the *School Review*, seem to have escaped notice. The double Christian name written out in full, relatively common in America, but rare on the continent, has led the foreign compiler into more than one difficulty. This and certain errors of the translator would thus appear to suggest the advisability of the collaboration of an American assistant if the work is to be of any great service to scholars in this country. At present its chief value for us lies in the enumeration of the French and German articles. While the titles are all in French, each is followed by the title in the original language when other than French. The worth of the whole is still further enhanced by complete subject matter, and author indexes. The rubrics in the classification are as follows:

general works; philosophy of education; history of education and comparative education; psychology; physical education and hygiene; environment and its influence; the teacher; discipline; the school; general and special method; moral education; religious education; civic education; institutions allied with the school; education of the physically and mentally defective.

M. Cellérier, an educator of Geneva, and M. Dugas, lecturer at the University of Rennes, are to be congratulated upon this excellent piece of work that offers so much promise of international usefulness.

FREDERIC ERNEST FARRINGTON

TEACHERS COLLEGE
COLUMBIA UNIVERSITY

Secondary and university education in France. English Board of Education special reports on educational subjects, Vol. 24—By P. J. HARTOG, Academic Registrar of the University of London, and others. London: Published by His Majesty's Stationary Office, 1911. xii + 564 p. 3s.

This volume is one of the most valuable of all those in the admirable series of educational reports issued by the English Board of Education, for it is one of the few that render real source material available for the English reader.

The curriculums of the French secondary schools for boys in accordance with the reform of 1902 together with the subsequent less significant modifications of 1905 and even later have been translated in full by Mr. P. J. Hartog, of the University of London. The programs are correct down to October, 1910. Certain changes, for obvious reasons not noted in the text, went into effect in October, 1913, but these are not sufficiently radical to vitiate in any appreciable degree the worth of the present accurate and painstaking translation. Mr. Hartog is certainly to be congratulated for the highly creditable manner in which he has acquitted himself of the rather thankless task of the translator. Elaborate indexes add to the usefulness of this piece of work. Mr. Hartog has appended

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supplementary comment on the aim of the new program, as well as some extremely instructive notes on classroom procedure in various subjects of instruction.

The chapter entitled A Comparison between French and English Schools by Mr. Cloudesley Brereton is particularly interesting. Mr. Brereton is a graduate of a French lycée and has at various times served as His Majesty's Inspector of Schools. He is therefore in position to speak intelligently of the education in the two countries. The pages on New Experiments in Secondary Education undertaken by Père Didon, M. Desmolins, and M. Duhamel are of special interest. It is unfortunate that the bibliography could not have been arranged in a more systematic and useful manner.

Other chapters are entitled Report on an Inquiry into the Method of Teaching the Mother Tongue in France, by Mr. Arthur H. Hope; The Secondary Education of Girls in France, by Mr. James Oliphant; Notes on the Teaching of Mathematics in the French lycées for Girls, by Miss A. E. Metcalfe; L'Enseignement Supérieur, by Monsieur Louis Cazamian; and L'École Normale Supérieure, by Dr. E. R. Edwards.

One is a little surprized to find a long article like that of M. Cazamian printed in French. If it seems advisable to publish this in its original form, one wonders why it could not have been followed by a translation, as has been done in former instances in this same series.

Nevertheless the volume will be of inestimable worth to every one interested in comparative education.

FREDERIC ERNEST FARRINGTON

TEACHERS' COLLEGE
COLUMBIA UNIVERSITY

School feeding—By LOUISE STEVENS BRYANT. Introduction by P. P. CLAXTON. J. B. Lippincott Company, 1913. 345 p. $1.50.

All persons interested in the humanitarian aspects of education will find a happy surprize in the reading of this volume. The feeding of children in the school is not a

new thing and it was well known that many experiments were being tried in this direction. But Miss Bryant, by her thoro investigation, has been able to present such a mass of interesting and instructive material as to put the subject upon an entirely different plane from what it has occupied before. This work has been done with such painstaking care and the material is arranged in such an orderly manner as to make it not only comprehensive but authoritative. It will serve for a long time to come as an encyclopoedia upon this subject.

In its essence, school feeding is an attempt to provide children, especially the very young, with simple, nutritious food where it is evident that they come to school poorly nourished and unfitted to do good intelligent work. This undertaking, which was first initiated for the sake of the school and the mental welfare of the children, has now become a great philanthropic movement. It is clearly seen that if in our large cities multitudes of children are suffering from mal-nutrition both by reason of the quality and quantity of nourishment they receive, there will follow marked deterioration in those human factors, which are fundamental to the welfare of society and the state.

In working out this problem in England, France, Germany and the United States, meals costing from one to five cents are provided to thousands of children, sometimes free and sometimes at cost. More than fifty cities in the United States have already well-organized plans for such feeding. Accompanying this work inquiries are made as to conditions in the home and, as far as possible, mothers are instructed in dietetics so that their home tables are more wisely and economically administered.

Where school feeding has been carried on long enough, parents and teachers both rejoice in the improvement of the health of the children and their increasing ability to do good mental work. Wrapped up with this movement there are many moral and social by-products, such as the training of children in the proper conduct while eating and those social graces and courtesies, which are prevalent in

good society. Not only is there a complete record of what has already been accomplished in the way of school lunches, but meals in open-air schools are carefully considered and the general effect of underfeeding as based upon statistics gathered in New York, Chicago, Philadelphia, Boston, and other cities. The physical and mental effects of malnutrition also receive attention. Perhaps the most important part of the work is the scientific explanation of the reasons for specific dietaries as related to the chemical needs of the body. All this is made reasonably simple and with some explanation can become of practical value to mothers of average intelligence.

This book is unique, and so far has exclusive control of the field which it seeks to cover. No doubt rapid progress will be made in this department of education—for such it really is—but for the present any one seeking knowledge in this line will find that the author has left no stone unturned in gathering the best information, based upon all past experience.

SAMUEL T. DUTTON

TEACHERS COLLEGE
COLUMBIA UNIVERSITY

We have received and carefully examined the newest and latest edition of the new *Standard dictionary of the English language*. This edition is not only a complete, compact and well-made volume, but an hour's examination of it proves that the publishers are entirely justified in claiming that it is an absolutely new creation from cover to cover.

We have turned to a number of words, one after another, the treatment of which we deemed to be a good test of a serviceable dictionary, and have in no case been disappointed. This dictionary deserves, and should have, a very wide use as a standard book of reference. Two curious and interesting additions are tables of population, and a novel classification of historical events according to the days of the year on which they are supposed to have happened. The

striking characteristics which made the earlier edition of this book so successful are retained in this newest and latest form. (New York: Funk & Wagnalls, 1913. 2916 p.)

There has long been a demand for a general survey of American history that would come within the compass of a single volume. This has now been provided by Professor John Spencer Bassett of Smith College under the title *A short history of the United States*. Professor Bassett has made a really excellent book. It is not unduly political in its content and point of view, for it gives much space to social and institutional development. The poorest part of the book, as is usual in works of this kind, is that which deals with most recent events. (New York: The Macmillan Company, 1913. 885 p. $2.50.)

A little volume that is worth almost its weight in gold is *Experiments in government and the esssentials of the constitution*, by Elihu Root. Of all contemporary Americans in public life, Senator Root is perhaps the only one who towers so high as to be indubitably a statesman. His trained and well-filled mind is seen at its best in the expositions and criticisms that make this little volume of exceptional importance. (Princeton University Press, 1913. 82 p. $1.00.)

A good practical survey of arithmetic dealing with those operations and forms of calculation most often made in business is *Essentials of business arithmetic*, by George H. Van Tuyl of the High School of Commerce, New York. (New York: American Book Company, 1913. 272 p. 70c.)

We have noted from time to time in these pages the rapid multiplication of books on agriculture. We have formed the distinct impression that too many of them are appearing from the press, and that most of them are written for purely commercial ends. *Materials and methods in high school agriculture*, by Assistant Professor Hummel of the University of California, and Bertha Royce Hummel, is no better and no worse than many others of its class,

but it does seem to be one too many. (New York: The Macmillan Company, 1913. 385 p. $1.25.)

A useful book for secondary schools, well illustrated and conveying an immense amount of information, is L. H. Bailey's *Botany for secondary schools*. It has for its laudable purpose to guide the pupil to an understanding of the vegetation of his neighborhood. (New York: The Macmillan Company, 1913. 465 p. $1.25.)

For work in the household arts, which subject is rapidly finding its way into schools for girls everywhere, we commend the volume entitled *Shelter and clothing*, by Professors Helen Kinne and Anna M. Cooley of Teachers College, Columbia University. The material is well ordered and the letter press carefully and clearly written. (New York: The Macmillan Company, 1913. 377 p. $1.10.)

A very simple elementary work in chemistry is entitled *Laboratory experiments in general chemistry*, by Assistant Professor H. B. North of Rutgers College. (New York: D. Van Nostrand Company, 1913. 205 p. $1.00.)

It would be interesting to know how farm arithmetic differs from any other kind of arithmetic. We have not been able to get an answer to this question by reading the textbook entitled *Farm arithmetic*, by Charles William Burkett and Carle Dale Swartzel. As nearly as we can ascertain, farm arithmetic consists in selecting problems that are based upon farm products and farm processes. (New York: The Orange Judd Company, 1913. 280 p. $1.00.)

There is no more fascinating or eloquent writer or speaker in France than M. Emile Boutroux, Director of the Fondation Thiers. The translation under the title of *Education and ethics* of his book on that subject is of genuine service to American readers and teachers. We trust it may have a wide reading. (New York: The Macmillan Company, 1913. 236 p. $1.50.)

A somewhat luridly illustrated book, the tone of which at many points might be improved, is Walter M. Coleman's handbook, *The people's health*. (New York: The Macmillan Company, 1913. 307 p. 70c.)

The latest issue of the admirable Oxford French Series is Laboulaye's *Abdallah*, edited by Professor Schinz of Smith College. This is a capital reading book for schools. (Oxford University Press, 1913. 295 p. 60c.)

There is much to stimulate thought and to guide reflection in the excellent volume entitled *College English*, by Professor Aydelotte of Indiana University. The author's purpose is to endeavor to make elementary literature and English composition as taught in college a more thoughtful and a more human study. That this transformation is sadly needed, much experience, and many discussions in this review have tried to make plain. Professor Aydelotte has made a book that ought not to be overlookt by college teachers of English. (New York: Oxford University Press, 1913. 150 p. 60c.)

Quite a different type of book, yet one useful in its way is *English literature*, by Reuben Post Halleck, a well-known writer of textbooks in different subjects. (New York: American Book Company, 1913. 562 p. $1.30.)

Still another type of book that is exceedingly helpful, particularly to adult readers in appreciating English literature, is *Thru England with Tennyson*, by Oliver Huckel. The author describes minutely and with good illustrations those scenes and places which Tennyson's poetry has made memorable. (New York: Thomas Y. Crowell. 249 p. $2.00.)

A stout volume of the public information type, dealing with the whole range of Greek art, is *The message of Greek art*, by H. H. Powers. (New York: The Macmillan Company, 1913. 336 p. $2.00.)

The difficulties of French pronunciation will be lightened by a careful use of *French pronunciation*, by Professor

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Geddes of Boston University. Certainly no one ever learned to pronounce French properly from a book, but this book will lay the foundation for that practise and that experience which alone can lead to an understandable use of the language. (New York: Oxford University Press, 1913. 262 p. 75c.)

Teachers of geography will be helped by a book entitled *Globes and maps*, by Inspector Wiswell of the New York State Education Department. The author gives a great deal of interesting information that is ordinarily not at hand for use of the teacher. (Chicago: Rand McNally & Company, 1913. 64 p. 50c.)

In his book entitled *The new American drama*, Professor Burton of the University of Minnesota offers a series of studies in contemporary playwriting that are agreeably written and suggestive. The book is without an index. (New York: Thomas Y. Crowell Company, 1913. 277 p. $1.25.)

Where Latin is still taught with a view to being read, or by rare chance, spoken, there will be use for *Dialogues of Roman life*, by Assistant Master Winbolt of Christ's Hospital. (London: G. Bell & Sons, 1913. 142 p. 2s.)

A handy book for the desk is E. H. Barker's *Computing tables and mathematical formulas*. It contains powers, roots, circumferences, areas, logarithms, trigonometric formulas and various other information for which there is occasional use. (Boston: Ginn & Company, 1913. 88 p. 75c.)

President Hadley's full mind and philosophic habit of thought are shown to excellent advantage in his McNair lectures delivered a year ago at the University of North Carolina. They now appear in a little volume entitled *Some influences in modern philosophic thought*. President Hadley passes with genial familiarity from natural science to economics and from economics to poetry. The book is

charming. (New Haven: Yale University Press, 1913. 145 p. $1.00.)

The latest volume from the pen of James Bryce is entitled *University and historical addresses*. It is a collection of the chief speeches delivered by Mr. Bryce during his six years of service at Washington as British Ambassador. The book is appropriately dedicated to Elihu Root. It abounds in wise philosophy, sober reflection, and sound thinking. (New York: The Macmillan Company, 1913. 433 p. $1.50.)

Teachers of German will find help in dealing with their composition classes from the use of *Mündliche und schriftliche Uebungen*, by Assistant Professor Boezinger of Stanford University. We can rejoice to see a book built upon the direct method of instruction in a modern language. (New York: Henry Holt & Company, 1913. 136 p. 75 c.)

American teachers and students of Spanish will certainly welcome a volume containing a selection in a form convenient to handle and to read of the Castillian lyrics that are best adapted to reading in class. The book is entitled *Modern Spanish lyrics*, and has been put together by Professor Hills of Colorado College, and Dr. Morley of the University of Colorado. We should be glad to learn that a book like this is found to be a real stimulus to the study of Spanish in American schools and colleges. (New York: Henry Holt & Company, 1913. 433 p. $1.25.)

We are bound to say that our reaction upon the *Dickens dramatic reader*, by Fanny Comstock, is unfavorable. The treatment of the great novelist seems to us distinctly artificial and objectionable. (Boston: Ginn & Company, 1913. 338 p. 60 c.)

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IX

NOTES AND NEWS

A discussion as to new Universities in Germany

The EDUCATIONAL REVIEW has already called attention to the active discussion going forward in Germany as to whether or not new universities should be establisht, and as to how university administration can be improved. It appears that the example of the universities of the United States has not been without its effect in Germany, and there is a distinct reaching out on the part of German university professors for something of the benefits and the effectiveness that are clearly seen to follow from the system of university administration which prevails in America.

A few weeks ago the Fifth Congress of German University Teachers was held at Strassburg, and from the report printed in the *London Times* it is plain that the discussions were of more than usual interest.

The principal subject of discussion was the creation of new universities, which many members of the old foundations are inclined very strenuously to resist in the interests of what they believe to be university independence and the maintenance of a high academic standard. The facts are these: It is proposed shortly to found a new university at Dresden, and the money has been already collected. At Hamburg it is desired to make out of the existing Colonial Institute a Faculty for "Colonial Science," which would be the nucleus of a new university, and a bill in this sense has already been presented by the Senate to the Hamburg Diet. A university has been founded at Frankfort-on-Main, and it is proposed to raise the Posen Academy to the dignity of a "University for the East Mark." Recently, Cologne and Helmstedt have asserted their claims for universities, and have recalled the existence of former foundations which have long disappeared.

The case against the new foundations was explained in a report by Professor Bücher, of Leipzig. It said that the new movement was promoted largely by men who had no academic education, and that its worst feature was the preponderance of municipal influence. The corporations of the large towns were ready, generally for purely local interests, to found municipal universities as lightheartedly as if they were establishing a circus, by the simple process of raising the status of existing establishments. Under ministerial encouragement the standard of what constituted a university was being relaxed, and in some cases the medical and theological faculties were likely to be wholly dispensed with. The taxpayers, of course, desired to have a share in their governance, and the old university independence was seriously endangered. Other speakers said that political motives were at the back of the new foundations. Others called attention to the movement among Roman Catholics in favor of small denominational universities. The Conservatives said that these new foundations were wholly unnecessary. It was not true to say that Berlin with her 9,000 students, or Leipzig with her 5,000 students, was overcrowded. Their machinery was only adapted to large numbers, and the standard of teaching did not suffer. Professor Kaufmann, of Breslau, said that the new universities would not relieve the old, but would simply increase the number of students. As it was, there were too many, and 40 per cent of the students would do better not to study at all. Many Germans were paralyzed by academic training and rendered unfit for practical life.

The need of new universities was, however, warmly defended at the Congress. It was declared that in some of the old universities the experimental lectures were so crowded that many students could not see. Professors from Dresden and Hamburg said that university life must keep pace with the movement of the town *bourgeois* towards learning. The towns desired universities as a center of culture. Economic training in the old foundations was

stagnating, and the new institutions would infuse new life. The Hamburg University represented a movement of progress, and the Conservatives who opposed it—largely from fear of competition—would soon be left far behind, objects of ridicule. The mercantile world could not be studied in Heidelberg. A new and sounder academic type was being created. The increase of universities, the readiness of the towns to spend money in education, the suppression of the theological faculty, and other phenomena were part and parcel of a national movement which it was useless to oppose.

Connected with this question of the multiplication of universities is the standard of degrees. Professor Amira, of Munich, and other speakers said that the system by which the degree of doctor is conferred was in urgent need of reform. At present the German "Doctor" was the laughing-stock of foreigners, and no wonder. In 1910 there had been in Germany no fewer than 5,500 "dissertations" for the doctor's degree, while in Austria every doctor and lawyer had to have the title, and obtained it without a dissertation. Veterinary surgeons were now "doctors" and even dentists wished to get the title. The present system of examination was altogether loose. The standard was different in many places, and in many places the tests were never taken seriously. The technical high schools and schools of theology alone maintained universally a high standard. Elsewhere there was a chaotic system which was simply leading to a competition for the easiest conditions. Professor Amira expounded an elaborate system of reform, in the direction of uniformity of the "dissertation" and the *viva voce* test which, as a rule, comprize the examination for the degree. No special facilities must be admitted. The bodies which confer degrees must be autonomous. The dissertation must be more than a summary of other people's knowledge. It must have the character of research work and show the capacity of the candidate for independent scientific labor. It must be shown unquestionably to represent the candidate's own work. There must

also be reform in the *viva voce* of the system of voting and questioning. Finally the examiners must be made independent of all financial interest in the number of degrees. Promotion fees must be made the concern of the State and not the professors, and the salaries of teachers hitherto dependent upon these fees must be raised.

The American observer may be pardoned for saying that German universities will not better their condition until they get rid of the unhappy system of *collegien Geld* on the one hand, and acquire the advantages of a permanent and effective administrative system on the other. The dependence of the German universities upon the several ministries of education has many unfortunate effects. Occasionally the officials in these ministries are highly efficient, and very sympathetic; occasionally they are quite the opposite.

A distinct tendency now observable in Great Britain as well as in Germany to adapt to those countries some of the most characteristic features of American university organization, is in a high degree interesting and instructive.

A good example has been set by the Upper Peninsula Educational Association of Michigan in the establishment of a Bureau of Research for the purpose of making careful inquiry into the work of the elementary schools. The first report of the Bureau of Research has just been printed at Marquette and it is full of valuable suggestions. Dealing as it does with conditions near at hand, it is able to set out with precision and accuracy a large number of facts of a kind that are usually generalized from a remote distance. The report shows clearly what has been the preparation of the rural teachers, pointing out that in some counties the proportion without any training for their work rises as high as 45 and 41 per cent. In three counties it falls as low as 4, 5 and 6 per cent, respectively. The report also presents the distribution of pupils per teacher, the distribution of pupils in rural schools among the several grades, the number and nationality of the foreign-born

pupils in rural schools, the school equipment and methods of instruction. Similar statistics are given for cities and towns.

We heartily commend this as an admirable example of local self-consciousness. It is an example which should be widely imitated.

A recent bulletin of the United States Bureau of Education is devoted to teachers' pension systems in Great Britain. The author is Professor Sies of the University of Pittsburgh. As pension systems are just becoming the object of serious public attention in the United States, the facts and results set forth in this important study should be taken careful note of.

An interesting type of work is to be found in a pamphlet with the title *Choosing a career,* prepared for the High School Teachers Association of New York by a committee of their number. The idea behind the pamphlet and much of its execution are admirable. It is rather distressing, however, to see the cheap and tawdry books that boys are recommended to read. The bibliography at the end is quite unworthy of the rest of the pamphlet.

The *Pädagogisches Archiv* reports the appointment of Dr. Ferdinand Jacob Schmidt, formerly director of the Margaret Lyceum in Berlin, to be professor of education in the University of Berlin. Dr. Schmidt is fifty-three years of age and a native of the Rhine Province. In completing his gymnasial education he pursued his university studies in philosophy and theology at Berlin and took the degree of Doctor of Philosophy in 1888, the subject of his dissertation being *Herder's pantheistische Weltanschauung.* He has been director of the Margaret Lyceum since 1906.

On October 22 occurred the impressive dedicatory exercises of the newly founded and endowed graduate

college of Princeton University. The occasion brought together a notable assembly of scholars, including representatives of the universities of Paris, Oxford, Cambridge and Berlin. The ideal and purpose of the graduate college were clearly and persuasively set forth by a number of speakers, particularly by Dean West in an address entitled The Household of Knowledge. It is not too much to say that the exercises were raised to a plane of most unusual distinction by the participation of Dr. Francis L. Patton, formerly president of Princeton. His speech at the dinner on the evening of October 21 rose to the highest plane of academic eloquence and was illumed with the profoundest philosophical insight and the tenderest religious feeling. Dr. Patton's dedicatory prayer at the formal exercises on the day following was worthy of comparison with the finest examples of devotional writing that have come down to us thru the centuries.

The Thirteenth Annual Report of the secretary of the College Entrance Examination Board should be read and pondered in every secondary school and college in the country, and particularly by the members of the governing boards of those colleges named on page 64 of the Report, which by their stubborn insistence on holding separate sets of entrance examinations of their own are postponing the day when the educational system of the country will reap the fullest advantage of the epoch-marking work of the board of which each one of the colleges named is a member. The College Entrance Examination Board is the most successful as it is by far the most influential co-operative educational undertaking in the country. The number of students taking its examinations in June, 1913, was 4159, and the examinations were held simultaneously at no fewer than 170 points. For example, no less than eight students were examined at Paris, five at Munich, four at Geneva, and four at London. Of the candidates examined, 485 did not state the college or scientific school which they proposed to enter, while the remainder were

candidates for some one of seventy-nine colleges and scientific schools. There were 82 candidates for Amherst, 60 for Brown, 54 for Bryn Mawr, 645 for Columbia, 256 for Cornell, 177 for Dartmouth, 290 for Harvard, 184 for Massachusetts Institute of Technology, 105 for Mt. Holyoke, 206 for Princeton, 39 for Simmons, 190 for Smith, 48 for Tufts, 23 for the University of California, 82 for the University of Pennsylvania, 10 for the University of Wisconsin, 168 for Vassar, 188 for Wellesley, 220 for Williams, and 387 for Yale.

The financial system adopted by the Board has made itself self-supporting and its payment to examiners and readers has lately been increased.

After all that has been said and written about the lack of wisdom and dignity that mark the policy of advertising the professional schools of universities of high standing, it is rather disheartening to find advertisements of no fewer than nine such medical schools in a single issue of a weekly publication. Surely this is commercialism and not education.